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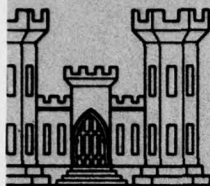
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DREDGED MATERIAL RESEARCH PROGRAM

TECHNICAL REPORT D-77-31

THE FLORA OF DREDGED MATERIAL SITES IN NAVIGATION POOL 8 OF THE UPPER MISSISSIPPI RIVER

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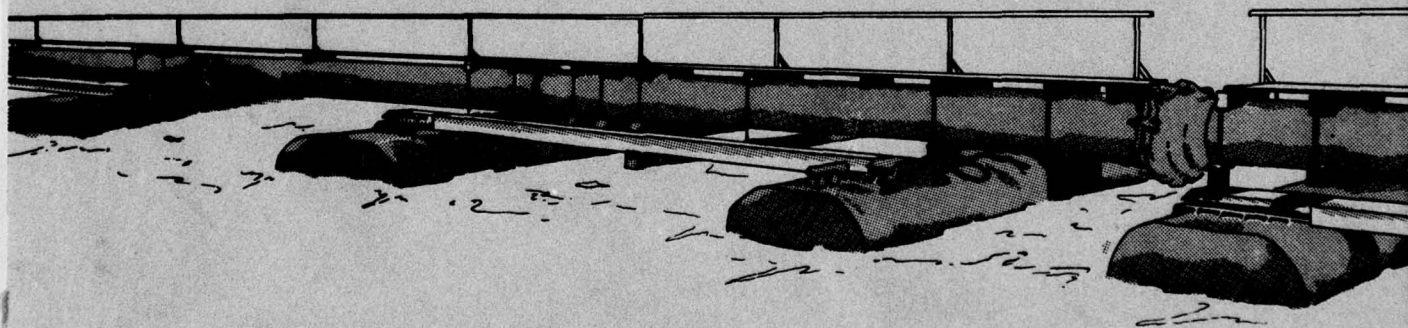
S. R. Ziegler, S. H. Sohmer
University of Wisconsin, La Crosse
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410585

November 1977

Final Report

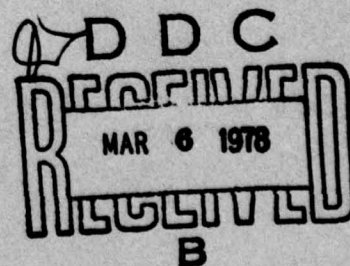
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Prepared for Office, Chief of Engineers, U. S. Army
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Under Contract No. DACW39-76-M-2076
(DMRP Work Unit No. 2A06)

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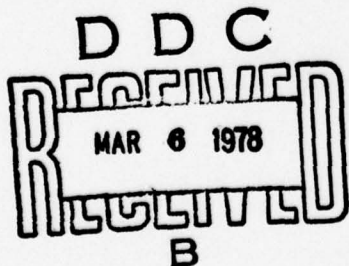
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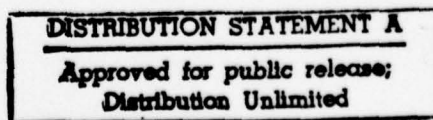
1. The technical report transmitted herewith represents the results of Work Unit 2A06 regarding documentation of the revegetation of dredged material deposits in the Upper Mississippi River. This work unit was conducted as part of Task 2A (Effects of Marsh and Terrestrial Disposal) of the Corps of Engineers' Dredged Material Research Program (DMRP). Task 2A is a part of the Habitat Development Project of the DMRP and is concerned with the definition and quantification of the effects of dredged material disposal in shallow water and terrestrial sites.

2. The purpose of this report was to document the patterns of natural revegetation on dredged material disposal sites in Navigation Pool 8, Upper Mississippi River. Correlations of site ages, elevations, and plant associations should prove useful in estimating the recovery rate of disposal sites in this geographic region. An understanding of the natural processes of revegetation will also be of value in habitat reclamation activities.

3. Work Unit 2A06 is one of several research efforts designed by the DMRP to document vegetative succession on dredged material islands and to evaluate the patterns of recovery at disposal sites. Closely related work units are 2A07 and 4A04B, both of which deal with the response of salt marsh vegetation to stress; 5B03, 4F01B, 4F01C, 4F01D, 4F01F, and 4F02, all of which examine patterns of upland succession on dredged material in different areas of the United States; and 4A13, 4B04, and 4B05, field sites at which natural succession is compared with man-induced vegetative restoration.



JOHN L. CANNON
Colonel, Corps of Engineers
Commander and Director





31 December 1977

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Wisconsin Univ. - LaCrosse

1. The technical report transmitted herewith represents the results of work done by the Wisconsin University of LaCrosse, LaCrosse, Wisconsin, in the Upper Mississippi River. This work was conducted as part of Task 1A (Effects of Human and Technical Disturbances) of the Corps of Engineers' Great Lakes Research Program (GMRP). Task 1A is a part of the Habitat Development Project of the GMRP and is concerned with the definition and quantification of the effects of degraded material disposal in shallow water and terrestrial areas.

2. The purpose of this report was to document the patterns of natural vegetation on degraded material disposal sites in Navigation Pool 8, Upper Mississippi River. Correlations of site area, elevation, and plant associations should prove useful in estimating the recovery rate of the area in this geographic region. An understanding of the natural processes of vegetation will also be helpful in habitat restoration activities.

3. Work done 1966 is one of several research efforts designed by the GMRP to document vegetation succession on degraded material disposal sites. To evaluate the patterns of recovery at disposal sites, closely related work was done 1967 and 1968, both of which deal with the response of soil surface vegetation to stress; 1969, 1970, 1971, 1972, and 1973, all of which examine patterns of windward succession on degraded material in different areas of the United States; and 1974, 1975, and 1976, which also all which examine succession in coastal with man-induced vegetation restoration.

W. J. CARPIS
Colonel, Corps of Engineers
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A survey of vegetation growing on dredged material in Navigation Pool 8 of the Upper Mississippi River was made to determine plant species. Twenty-three dredged material sites in Pool 8 were surveyed and more than 3000 specimens collected of 304 species representing 64 plant families. Correlation of site ages, elevations, and plant community associations was used to determine primary colonizers of the various dredged material habitats. (Continued)		

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20. ABSTRACT (Continued).

Sporobolus cryptandus (Torr.) Gray, Triplasis purpurea (Walt.) Chapm., Cyperus schweinitzii Torr., and Cycloloma atriplicifolium (Spreng.) Coult. were found to be pioneer herbaceous species of dry exposed dredged material sites. Upland invasion by woody species did not occur readily, but after a lengthy period species such as Vitis riparia Michx., Toxicodendron rydbergii Greene, and Rubus occidentalis L. encroached from surrounding forests.

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SUMMARY

Dredging of the Mississippi River is conducted by the Corps of Engineers to maintain the channel depth necessary for the transportation of heavy, high volume commodities by barges and towboats. The material dredged from the channel is usually placed on islands in the river and along the shoreline, often resulting in the destruction of the vegetation previously growing on the site. With the support of the U. S. Army Engineer Waterways Experiment Station at Vicksburg, Mississippi, the flora of the dredged material disposal sites in Navigation Pool 8 of the upper Mississippi River was determined. By correlating the ages of the sites, their elevations above mean sea level, and community associations of the specimens collected, a determination was made of the primary colonizers of the various habitats found on dredged material.

A preliminary survey of the vegetation growing on dredged material was conducted during the summer of 1974 on ten different sites. During the following summer a more extensive study was undertaken of 23 dredged material sites. This included the ten areas previously surveyed. Nearly every site was visited three times during the summer of 1975 in an effort to obtain all the spring-, summer-, and fall-flowering species. Specimens were collected in the different habitats found on these sites. During the two growing seasons nearly 3000 collections, each consisting of one to five specimens, were obtained. A total of 304 species representing 64 families were found on these dredged material sites. The largest families were the Cyperaceae (5 genera, 29 species), Gramineae (25 genera, 48 species), and Compositae (20 genera, 42 species).

Two grasses, Sporobolus cryptandrus (torr.) Gray and Triplasis purpurea (Walt.) Chapm., the sedge, Cyperus schweinitzii Torr., and a chenopodiaceous tumbleweed, Cycloloma atriplicifolium (Spreng.) Coult., were the pioneer herbaceous species of the dry, exposed dredged material sites in Navigation Pool 8. The invasion of these elevated sites by woody species does not occur readily, so the pioneers dominate the areas for long periods of time. Eventually, vines and shrubs such as Vitis

riparia Michx. (riverbank grape), Toxicodendron rydbergii Greene (poison ivy), and Rubus occidentalis L. (black raspberry) encroach on these exposed areas from the fringes of surrounding alluvial forests.

PREFACE

The work described in this report was performed under Contract No. DACW39-76-M-2076 between the U. S. Army Engineer Waterways Experiment Station (WES), Vicksburg, Mississippi, and the University of Wisconsin, La Crosse, Wisconsin. The study was sponsored by the Office, Chief of Engineers (DAEN-CWO-M), under the Civil Works Dredged Material Research Program (DMRP).

The research was conducted by Ms. Sarlyn R. Ziegler and Dr. S. H. Sohmer during the period from August 1975 to November 1976. The authors extend their thanks to the following individuals, who aided in the annotation of plant species: Dr. George W. Argus, National Herbarium of Canada, Ottawa, Ontario, Canada; Dr. C. John Burk, Smith College, Northampton, Massachusetts; Dr. Peter H. Raven, Missouri Botanical Gardens, St. Louis, Missouri; Dr. Robert W. Freckmann, University of Wisconsin-Stevens Point; Dr. R. G. Koch, University of Wisconsin-Superior; Dr. Stephen W. Ballou, CDM/Limnetics, Milwaukee, Wisconsin; Dr. Peter J. Salamun, University of Wisconsin-Milwaukee; Dr. Frank W. Gould, Texas A&M University, College Station, Texas; and Dr. James H. Zimmerman, 2114 Van Hise Avenue, Madison, Wisconsin.

This report was prepared for the Habitat Development Project (Dr. Hanley K. Smith, Manager) under Work Unit 2A06, which is part of Task 2A: Effects of Marsh and Terrestrial Disposal. Dr. John Harrison, Chief, Environmental Effects Laboratory (EEL), WES, provided general supervision. Dr. Luther F. Holloway, Research Botanist, EEL, monitored the technical aspects of this study. Technical review of this report was provided by Ms. Mary C. Landin and 1LT Robert Terry Huffman.

COL G. H. Hilt, CE, and COL J. L. Cannon, CE, were Directors of WES during the period of this study. Mr. F. R. Brown was Technical Director.

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CONVERSION FACTORS, U. S. CUSTOMARY
TO METRIC (SI) UNITS OF MEASUREMENT

U. S. customary units of measurement used in this report can be converted to metric (SI) units as follows:

<u>Multiply</u>	<u>By</u>	<u>To Obtain</u>
inches	2.54	centimeters
feet	0.3048	meters
miles (U. S. statute)	1.609344	kilometers
Fahrenheit degrees	0.555	Celsius degrees or Kelvins*

* To obtain Celsius (C) temperature readings from Fahrenheit (F) readings, use the following formula: $C = 0.555 (F - 32)$. To obtain Kelvin (K) readings, use: $K = 0.555 (F - 32) + 273.15$.

THE FLORA OF DREDGED MATERIAL SITES
IN NAVIGATION POOL 8 OF THE UPPER MISSISSIPPI RIVER

INTRODUCTION

1. The impoundment of the Mississippi River by the system of locks and dams has produced a series of artificial lakes or pools. Navigation Pool 8, stretching 23.3 miles,* is the third largest pool of the 13 pools in the St. Paul District. It extends from Lock and Dam No. 7 near Dresbach, Minnesota, 702.5 river miles above the mouth of the Ohio River, to Lock and Dam No. 8, river mile 679.2, at Genoa, Wisconsin (Figure 1). The southwestern Wisconsin counties of La Crosse and Vernon border the river on the east, while it is bordered by the Minnesota counties of Houston and Winona to the west.

2. Dredging activities in Navigation Pool 8 of the Mississippi River have resulted in the formation of numerous islands. This study was initiated to determine the flora of these sites. Incorporated with this information are the ages of these deposits and the elevations of the collection sites above mean sea level. By comparing similar environments on dredged material sites of different ages, an insight into plant succession in these floodplain communities was gained. Major emphasis was placed on the early stages of plant succession since most sites were covered by recent dredged material. The greatest representation was of the five-year age class. Of the 23 sites, only nine were ten years of age or older. The oldest of these sites remained undisturbed by additional deposition for a period of 23 years.

3. Several floristic studies have been conducted on dredged material deposits in the past. The earliest study was conducted in the floodplain of the Mississippi River between Minneapolis and St. Paul, Minnesota.¹ In this work, the pioneer stage of plant succession was

* A table of factors for converting U. S. customary units of measurement to metric (SI) can be found on page 8.

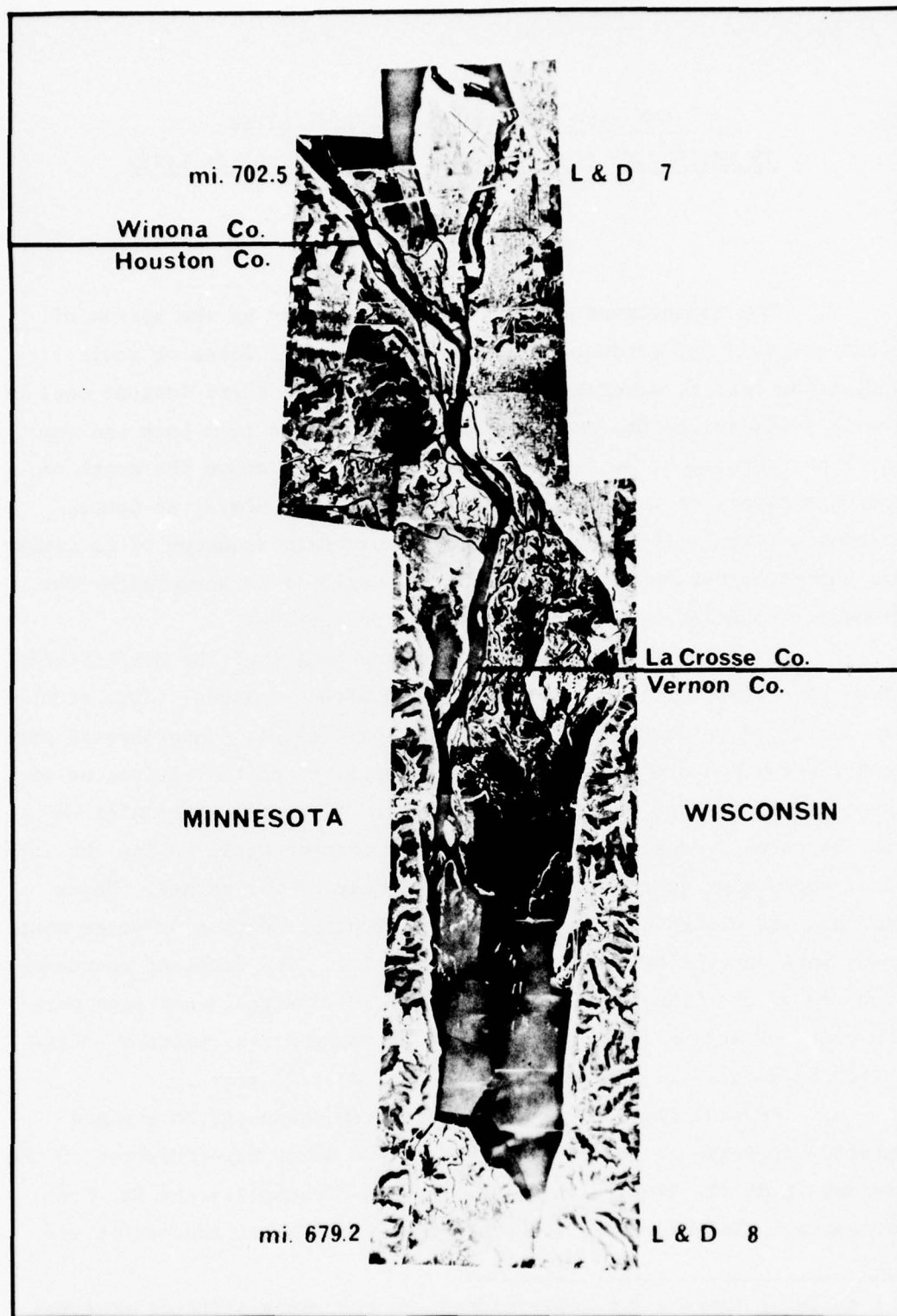


Figure 1. Aerial photograph showing political boundaries adjacent to Navigation Pool 8, Mississippi River.

emphasized. Lakala² undertook a four-year study of the pioneers on dredged material deposits near Duluth, Minnesota. Three decades later a floristic resurvey of this area was conducted by Bernard and Davidson.³ Dredged material deposition along the Hudson River in eastern New York provided McVaugh^{4, 5} with a suitable area for the study of plant succession over two decades. McVaugh's first published report⁴ covered the period 1935 to 1945. His second report described the vegetational changes occurring between 1945 and 1955.⁵

4. The climax community, the final or stable community in a successional series, is influenced by the prevailing regional climate. The climate of this area, designated as humid-continental, is expressed by hot summers and very cold winters.⁶ Located in the middle latitudes of the central North American continent, this area is influenced by arctic, subtropical, and continental air masses. Their relative duration and the frequency of their shifts control the weather. Seasonal contrasts are strong. High temperatures prevail in summer when subtropical air masses dominate the area. During the winter much colder weather prevails due to the dominance of the cold, dry, polar air masses. Along the Mississippi River at La Crosse the average July temperature is 72.8°F (22.7°C), while the average temperature for January is 16.1°F (-8.8°C).⁷ Extreme temperatures of 108°F (42.2°C) in July 1936, and -43°F (-41.7°C) in January 1873, have been recorded.⁸ A temperature of 28°F (-2.2°C) or below serves as a guideline for killing frost with regard to native plants.⁹ In Wisconsin a growing season of 183 days has been determined for native plants. The growing season for cultivated crops, with killing frost temperature set at 40°F (4.4°C) or below, is 124 days.⁹

6. About 30 in. of precipitation is received annually and nearly 60 percent of this is acquired between the warm months of May and September.¹⁰ The majority of the rainfall in the northern Midwest results from the contact of subtropical and arctic air masses. When these two air masses meet, the warm, moist, subtropical air rises. As this air cools, the moisture contained within it is released as rain. The interaction of these two air masses with the dry, continental air

determines where rainfall will occur. When continental air masses are strong, drought conditions prevail on the plains and in the Upper Mississippi and Ohio Valleys.¹¹ These westerlies inhibit contact between the arctic and subtropical air masses until they advance further east. During periods when the westerlies are weak or lacking, the arctic and subtropical air masses meet over the plains or the Upper Mississippi resulting in rain.

7. The climatic climax of the southwestern half of Wisconsin designated by Curtis and McIntosh¹² as the prairie-forest province, is likely to be a hardwood forest. Where topography, soil, or water modify the effects of the prevailing regional climate, edaphic climaxes are reached in succession.¹³ In this region terrestrial areas of abundant moisture, as in river floodplains, may come to be dominated by willow, cottonwood, American elm, or silver maple. Maple and basswood dominate well-drained mesic sites, while a series of oak species develops on progressively drier sites.¹⁴

8. During the course of a revegetation project, conducted by the River Studies Center of the University of Wisconsin-La Crosse, data on various weather parameters and on physical and chemical properties of recently deposited dredged material were collected. The primary purpose of this study was to record the conditions affecting the survival of three grass species and two species of legumes after planting. Provided that the survival and growth of these five species were adequate, the stabilization of the sand from wind and water erosion could be accomplished.

9. The results of the various soil analyses obtained during the summer of 1974 showed the soil to be porous, subject to large fluctuations in temperature, and very nutrient poor. The one year old dredged material, slightly alkaline in nature with a pH near 7.6, contained low levels of nitrate-nitrogen, potassium, and phosphorus. Throughout the summer the average levels of these nutrients remained below 10 ppm. Moisture retention capacity of this substrate averaged 23.8 percent. Soil temperature surveys were conducted three times each day during the

summer. Surface temperatures during early morning were as low as 50°F (10°C). However, the surface soil temperature often reached 122°F (50°C) during the afternoon. The results of the revegetation project have demonstrated that dredged material provides a very rigorous, unstable environment. The purpose of studying the flora of these sites was to determine the species capable of colonizing this environment.

MATERIALS AND METHODS

10. The dredged material sites that were studied are shown on the aerial photograph of Navigation Pool 8 (Figure 2). The locations and ages of the sites were obtained from the U. S. Army Engineer District, St. Paul.

11. The collection of specimens occurred during two growing seasons. During the summer of 1974 10 sites were briefly investigated. Nearly 700 specimens were collected. The next season 13 additional dredged material sites were covered in the survey. This time a more intensive study was conducted. Most of the 23 sites were visited three times during the summer of 1975 to obtain all spring-, summer-, and fall-flowering species. During this period approximately 2300 collections were gathered. A collection consisted of one to five specimens from an individual or colonial population. A random method of collection was carried out in the different habitats present on these sites. After a morning of field work, the plants were brought into the laboratory at the University of Wisconsin-La Crosse to be pressed. After drying was completed, the pressed specimens were stored in the herbarium of the University for later identification. Appendix A is a list of all scientific and common names mentioned in this report.

12. When the collection of specimens was completed in early autumn of 1975, a survey of elevations in various habitats was conducted. With the aid of an Abney level and tape measure, the height of these areas above the pool's surface was determined. During this survey notes were made concerning the vegetation present. The St. Paul District was able to supply the pool's elevation above mean sea level at several locations for those days the survey was conducted. This information was combined with that obtained from the field work to produce the elevations above sea level that were useful in the analysis of these dredged material sites.

13. Various manuals and monographs were employed to obtain accurate identifications of the species present on dredged material. Those keys used to the greatest extent were Gray's Manual of Botany, 8th edition¹⁵

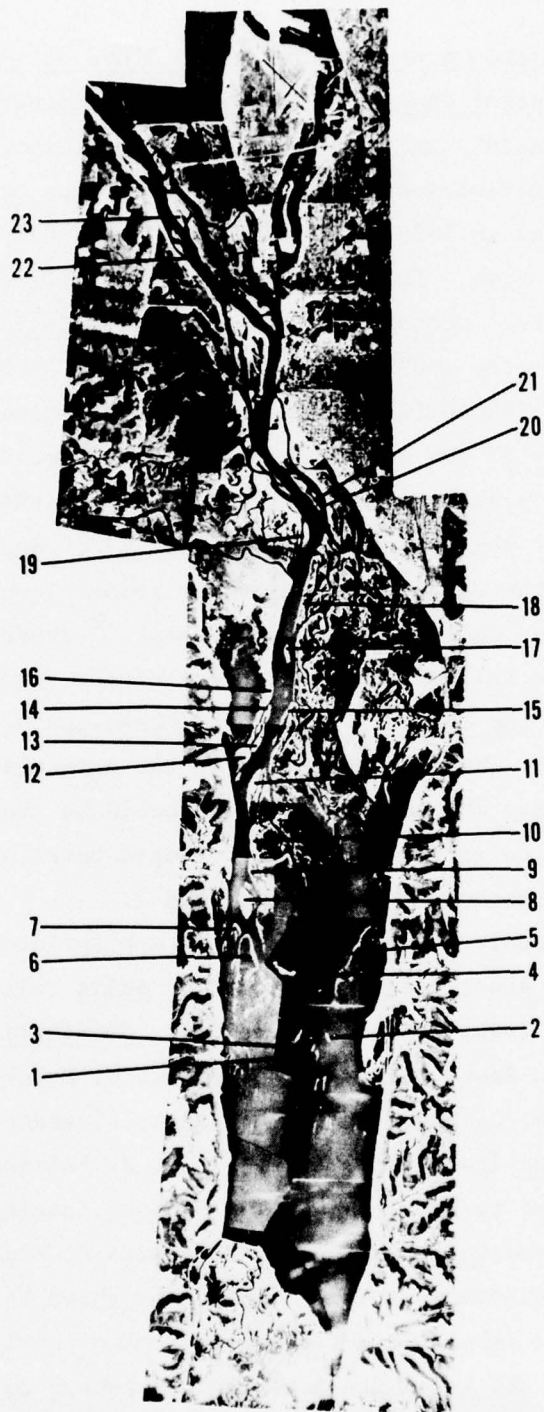


Figure 2. Aerial photograph of Navigation Pool 8, Mississippi River, showing dredged material sites.

and The New Britton & Brown Illustrated Flora of the Northeastern United States and Adjacent Canada.¹⁶ The work "Preliminary Reports on the Flora of Wisconsin" was very helpful in the identifications of the members of some families. This series was begun by Norman C. Fassett and his students in 1929. The publication of these keys has continued to the present time. The reports for the following taxa were utilized: Caryophyllaceae,¹⁷ Compositae III - the genus Solidago,¹⁸ Cruciferae,^{19,24} Cyperaceae II - the genus Cyperus,²⁰ Labiatae,²¹ Polygonaceae,²² and Salicaceae.²³ Stuckey's recent monograph was valuable for identification of members of the genus Rorippa.²⁴ The name determined for poison ivy was based on the treatment by Gillis.²⁵ Shinn's,²⁶ treatment of the genus Aster was also utilized. A Manual of Aquatic Plants²⁷ was beneficial in the identification of the genus Bidens in the Compositae family. Another manual written by Fassett,²⁸ Grasses of Wisconsin, was utilized in the initial identifications of the Gramineae. Manual of the Grasses of the United States²⁹ was consulted briefly in making a few determinations. When discrepancies in the nomenclature arose, Gray's Manual of Botany, 8th edition¹⁵ was accepted as the final authority. Listings of vascular flora found on dredged material sites in Navigation Pool 8 are presented in Tables 1, 2, and 3.

14. Difficult genera were sent to appropriate experts for annotation. Those genera sent out included: Salix (willow) to Dr. George W. Argus, Quercus (oak) to Dr. C. John Burk, Oenothera (evening primrose) to Dr. Peter H. Raven, Aster to Dr. Robert W. Freckmann, Bidens (stick-tight) to Dr. R. G. Koch, Erigeron (daisy fleabane) to Dr. Stephen W. Ballou, Solidago (goldenrod) to Dr. Peter J. Salamun, Echinochloa (barnyard grass) to Dr. F. W. Gould, Panicum (panic grass) to Dr. Robert W. Freckmann, and Carex (sedge) to Dr. James H. Zimmerman.

15. All specimens are accompanied by three labels. In addition to the descriptive label, an aerial photograph of Navigation Pool 8 is attached. On this label the location of the appropriate dredged material site is designated. Also included with each specimen is an enlarged outline of the dredged material site designating the location where the

specimen was collected. After proper processing one set of specimens will be permanently preserved in the herbarium of the University of Wisconsin-La Crosse. The remaining sets will be distributed to other herbaria.

RESULTS

16. The species identified in Table 1 were obtained from the 23 dredged material sites investigation in Navigation Pool 8 of the upper Mississippi River. The families are listed alphabetically within their major classification groups, and the genera within each family are also listed alphabetically, as are the species. Each species is accompanied by a common name, the numbers of the sites where it was collected, the senior author's collection numbers, as well as a commentary. In this commentary the habitat types and the average elevations of the collection areas are stated. The surface of the water in Navigation Pool 8 is maintained for commercial traffic at an elevation of 631 feet above mean sea level (msl). Therefore, it can be determined whether these species grow in moist areas within a few feet of the maintained pool elevation or on more elevated sites. Summaries of the systematic composition of the flora on dredged material in Navigation Pool 8 are provided in Tables 2 and 3. Of those genera that were sent for annotation, the determinations for Oenothera and Erigeron have not been returned at the present time.

Table 1. Listing of the vascular flora collected on dredged material sites, Navigation Pool 8. All elevations are expressed in feet above mean sea level (msl). Common and scientific names of all species are listed in alphabetical order in the appendix.

EQUISETOPHYTA

Equisetaceae (Horsetail Family)

Equisetum arvense L.

Weedy borders of alluvial forests, 634 feet

Islands: 4, 5, 6, 8, 9, 10, 11, 16, 18

Collections: 108, 124, 132, 155, 308, 487, 699, 1094, 1113, 1143, 1283, 1359, 1439, 1502, 1526, 1584, 1781

Equisetum hyemale L.

Edge of weedy border along hardwood forests, 637 feet

Islands: 4, 8

Collections: 319, 1096, 1537, 2449

Table 1 (continued)

CONIFEROPHYTA
Cupressaceae (Cypress Family)

Juniperus communis L.

Open dry areas, 640 feet

Islands: 8, 12

Collections: 1075, 1212, 1583

MAGNOLIOPHYTA

Liliatae
Alismataceae (Water-Plantain Family)

Alisma subcordatum Raf.

Moist alluvial woods, 634 feet

Islands: 4, 20, 21

Collections: 2057, 2461, 3041

Araceae (Arum Family)

Arisaema dracontium (L.) Schott

Small Phalaris meadows in alluvial woods, 633 feet

Islands: 9, 10, 15

Collections: 503, 1138, 2135

Commelinaceae (Spiderwort Family)

Tradescantia ohiensis Raf.

Dry open area, 637 feet

Island: 4

Collection: 1026

Cyperaceae (Sedge Family)

Carex brevior (Dew.) Mackenz.

Dry open area and border of Salix community along slough, 632 to 638 feet

Islands: 8, 16, 21

Collections: 1099, 1319, 1382

Carex cristatella Britt.

Moist Salix community, 633 feet

Islands: 6, 7, 10, 11, 12, 17, 21

Collections: 189, 251, 1389, 1428, 1443, 1456, 1738, 1808, 1975

Carex emoryi Dew.

Moist Salix community, 633 feet

Islands: 1, 2, 12, 20

Collections: 209, 959, 992, 2065

Table 1 (continued)

Carex hystericina Muhl.

Moist Salix community, 632 feet

Island: 7

Collections: 1060, 1427

Carex laeviconica Dew.

Sandy open areas, 634 feet

Islands: 1, 2, 4, 5, 8

Collections: 1017, 1102, 1505, 1529, 1634, 1678

Carex lanuginosa Michx.

Sandy open areas, 634 feet

Islands: 3, 5, 8

Collections: 976, 1504, 1562, 1661

Carex muhlenbergii Schkuhr.

Dry open area, 644 feet

Island: 13

Collection: 1179

Carex muskingumensis Schwein.

Moist border of slough, Salix community, 634 feet

Islands: 9, 21

Collections: 1974, 2672

Carex stipata Muhl.

Moist sandy areas, 633 feet

Islands: 4, 7, 8, 11

Collections: 119, 1009, 1062, 1085, 1420

Carex tenera Dew. or

Carex tenera Dew. X Carex normalis Mackenz.

Moist Salix community, dry weedy border of alluvial woods, 632 feet to 638 feet

Islands: 2, 10, 19, 22

Collections: 926, 939, 993, 1154

Carex tribuloides Wahlenb.

Moist border of slough, Salix community, 634 feet

Islands: 8, 9, 17, 20, 21

Collections: 275, 1078, 1322, 1333, 1762, 2054

Carex typhina Michx.

Dry open areas, 638 feet

Island: 10

Collection: 1731

Table 1 (continued)

Carex vulpinoidea Michx.

Moist sandy borders of Salix community, 632 feet

Islands: 6, 9

Collections: 1129, 1451, 1762a, 1764

Cyperus aristatus Rottb.

(Cyperus inflexus Muhl.)

Moist sandy borders of sloughs, 633 feet

Islands: 3, 4, 6, 7, 9, 11, 14, 15, 18, 20, 21

Collections: 434, 489, 1429, 1481, 1550, 1666, 1778, 1786,
1994, 2013, 2069, 2128, 2143, 2158, 2332, 2998, 3033

Cyperus erythrorhizos Muhl.

Moist sandy borders of river and sloughs, 633 feet

Islands: 1, 3, 4, 10, 16, 18

Collections: 596, 1548b, 1723, 2603, 2621, 2997

Cyperus esculentus L.

Moist sandy borders, 633 feet

Islands: 1, 2, 6, 9, 10, 11, 14, 18, 19, 20, 21, 22

Collections: 461, 1457, 1599, 1679, 1727, 1755, 1894,
2001, 2015, 2073, 2156, 2950, 3006, 3034

Cyperus lupulinus (Spreng.) Marcks

ssp. lupulinus

Dry open areas, 642 feet

Islands: 8, 12

Collections: 1823, 2409, 2410

Cyperus lupulinus (Spreng.) Marcks spp.

lupulinus x Cyperus schweinitzii Torr.

Dry open areas, 642 feet

Islands: 4, 19, 20, 21, 23

Collections: 1531, 1831a, 1832, 1850, 1928, 1953, 2034,
2793, 2960

Cyperus odoratus L.

Moist sandy borders, 633 feet

Islands: 1, 2, 3, 4, 6, 9, 10, 13, 14, 18, 19, 20

Collections: 515, 516, 517, 563, 564, 1474a, 1548, 1549a,
1599b, 1665, 1674, 1739, 1765, 1777, 2000, 2072, 2533a,
2688, 2841, 2949, 2996

Cyperus rivularis Kunth

Moist, Salix community, 632 feet

Island: 7

Collection: 2321

Table 1 (continued)

Cyperus schweinitzii Torr.

Dry open areas, 643 feet

Islands: 1, 2, 3, 4, 5, 7, 8, 10, 11, 12, 13, 19, 20, 22, 23
Collections: 175, 200, 379, 528, 529, 530, 531, 571, 657, 675,
680, 746, 747, 1164, 1190, 1211, 1489, 1532, 1555, 1586,
1633, 1660, 1712, 1733, 1752, 1799, 1831, 1849, 1865, 1917,
2033, 2333, 2411, 2451, 2466, 2525, 2526, 2554, 2882

Cyperus strigosus L.

Moist sandy borders, 633 feet

Islands: 1, 4, 6, 7, 8, 9, 10, 17, 21
Collections: 256, 332, 514, 1437, 1474, 1548a, 1549, 1554,
1599a, 1739a, 1956, 2117, 2311, 2378, 2478, 2479, 2533, 2570

Eleocharis acicularis (L.) R. & S.

Moist border along slough, 632 feet

Islands: 1, 17, 20, 21
Collections: 1321, 1594, 2082, 2107

Eleocharis calva Torr.

Moist sandy borders along sloughs, 632 feet

Islands: 1, 4, 5, 6, 7, 8, 10, 11, 17, 18, 21
Collections: 104, 273, 958, 1022, 1061, 1084, 1153, 1320,
1425, 1462, 1507, 1542, 1593, 3010

Eleocharis obtusa (Willd.) Schult.

Moist sand, 633 feet

Islands: 18, 20
Collections: 2022, 2077

Hemicarpha micrantha (Vahl) Pax

Moist sand, 634 feet

Islands: 7, 9, 18
Collections: 1774, 1785, 2014, 2347, 3013

Scirpus atrovirens Willd.

Moist sand to mud, 632 feet

Islands: 7, 9
Collections: 1433, 1761

Scirpus cyperinus (L.) Kunth

Moist sandy borders of marsh, 632 feet

Islands: 1, 9, 10, 11
Collections: 435, 519, 713, 2575

Scirpus validus Vahl

Moist sandy borders of marsh, 632 feet

Table 1 (continued)

Islands: 1, 2, 7, 8, 9, 10, 11, 17, 18
Collections: 135, 286, 390, 512, 963, 1059, 1087,
1155, 1698, 1766, 2027

Gramineae (Grass Family)

Agropyron repens (L.) Beauv.

Dry open areas, 636 feet

Islands: 2, 7, 8, 9, 11, 12, 13, 16
Collections: 158, 199, 370, 455, 1039, 1081, 1172,
1210, 1263, 1378, 1573, 1576, 1677, 1687, 1790

Agrostis gigantea Roth.

Open areas, 636 feet

Islands: 3, 17
Collections: 255, 1658, 2087

Agrostis hyemalis (Walt.) BSP.

Open areas, 636 feet

Island: 3
Collection: 1646

Agrostis perennans var. aestivalis Vasey

Alluvial woods, 634 feet

Islands: 4, 7, 18, 19, 20, 21
Collections: 2314, 2464, 2929, 2978, 3040, 3044, 3071

Agrostis scabra Willd.

Open areas, 634 feet

Islands: 1, 3, 4, 5, 19, 20, 21
Collections: 1301, 1506, 1528, 1627, 1652, 1927, 2031

Bromus kalmii Gray

Open areas, 636 feet

Island: 12
Collection: 2742

Bromus tectorum L.

Dry open areas, 636 feet

Islands: 1, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 17,
19, 21, 22, 23
Collections: 145, 157, 201, 369, 382, 452, 527, 923,
937, 944, 957, 968, 1041, 1069, 1083, 1107, 1137,
1166, 1201, 1248, 1256, 1257, 1307, 1341, 1472,
1491, 1610, 1645, 1835

Table 1 (continued)

Calamagrostis inexpansa Gray var.

brevior (Vasey) Stebbins

Alluvial woods, 636 feet

Island: 16

Collection: 1384

Cenchrus longispinus (Hack.) Fern.

Open areas, 634 feet

Islands: 1, 2, 4, 7, 8, 9, 10, 20

Collections: 749, 1567, 1630, 1693, 1789, 2035, 2318,
2437, 2541, 2593, 2692, 2761

Digitaria ischaemum (Schreb.) Muhl.

Moist sand of Salix community, 633 feet

Island: 17

Collection: 2089

Digitaria sanguinalis (L.) Scop.

Moist sand of river shorelines, 633 feet

Island: 9

Collection: 2701

Echinochloa crusgalli (L.) Beauv.

var. crusgalli

Moist sand of river shoreline and
Phalaris meadow, 633 feet

Islands: 7, 20

Collections: 2079a, 2342

Echinochloa muricata (Beauv.) Fern.

var. microstachya Wiegand

Moist sand of slough and river shorelines,
633 feet

Islands: 1, 8, 9, 10, 11, 14, 15, 17, 21, 22

Collections: 432, 740, 2134, 2380, 2602, 2657, 2700,
2838, 2877, 3025, 3038, 3123

Echinochloa muricata (Beauv.) Fern.

var. muricata

Moist sand of slough and river shorelines,
633 feet

Islands: 1, 3, 6, 7, 9, 10, 12, 15, 16, 18, 20, 21, 22

Collections: 453, 1973, 1998, 2016, 2078, 2337, 2502,
2582, 2623, 2650, 2728, 2848, 2849, 2922, 3009, 3031,
3116

Table 1 (continued)

Echinochloa walteri (Pursh) Heller

Moist sand of slough and river shorelines,
633 feet

Islands: 1, 4, 15, 18, 20

Collections: 1997, 1999, 2079, 2133, 2440,
2462, 2578

Elymus canadensis L.

Dry open areas, 636 feet

Islands: 2, 12, 13

Collections: 532, 1701, 1822, 2185

Elymus virginicus L.

Alluvial woods and open areas, 633 feet
to 644 feet

Islands: 2, 4, 6, 7, 8, 9, 10, 12, 13, 14, 15,
16, 18, 19, 20, 21, 22, 23

Collections: 294, 350, 381, 451, 539, 638, 658,
679, 736, 1729, 1795, 1904, 1919, 1926, 1942,
2029, 2088, 2150, 2163, 2167, 2194, 2202, 2329,
2360, 2390, 2402, 2475, 2503, 2521, 2567, 2644,
2681, 2853, 2979, 3084, 3114

Eragrostis frankii C. A. Mey.

Moist sand along slough, 632 feet

Island: 13

Collection: 2815

Eragrostis hypnoides (Lam.) BSP.

Moist sand, 634 feet

Islands: 9, 15, 17, 18, 20, 21, 23

Collections: 562, 599, 1776, 1976, 1993, 2019,
2068, 2123, 2878, 2995, 3094

Eragrostis pectinacea (Michx.) Nees.

Moist sand along shores, dry open areas,
632 feet to 642 feet

Islands: 1, 2, 3, 4, 7, 9, 10, 11, 12, 13, 14,
15, 16, 17, 18, 19, 20, 21, 22

Collections: 250, 252, 459, 490, 1410, 1522, 1611,
1624, 1647, 1663, 1676, 1680, 1686, 1737, 1744,
1769, 1811, 1868, 1891, 1948, 1992, 2002, 2024,
2066, 2083, 2113, 2126, 2141, 2203, 2305, 2532,
2605, 2612, 2697, 2744, 2820, 2921, 2945, 2990,
3008, 3035, 3121

Table 1 (continued)

Eragrostis spectabilis (Pursh) Steud.

Dry open areas, 638 feet

Island: 19

Collection: 2930

Festuca octoflora (Walt.) or

Vulpia octoflora (Walt.) Rydb.

var. tenella (Willd.) Fern.

Dry open areas, 636 feet to 646 feet

Islands: 21, 22

Collections: 897, 1303, 1877

Glyceria grandis S. Wats.

Moist sand of marshy borders, 632 feet

Islands: 7, 11

Collections: 394, 433, 1421

Leersia lenticularis Michx.

Moist sand of alluvial woods, 636 feet

Island: 23

Collection: 3092

Leersia oryzoides (L.) Sw.

Moist sand of marshy borders, 633 feet

Islands: 1, 2, 3, 4, 7, 9, 10, 11, 18, 20, 21

Collections: 732, 2336, 2460, 2558, 2579, 2622,
2649, 2658, 2674, 3007, 3029, 3070

Leersia virginica Willd.

Alluvial woods, 634 feet

Islands: 15, 16, 18, 19, 22, 23

Collections: 2855, 2904, 2956, 2980, 2993,
3088, 3091, 3115

Leptoloma cognatum (Schultes) Chase

Dry open areas, 636 feet to 646 feet

Islands: 20, 22, 23

Collections: 1834, 1870, 2028, 3078

Muhlenbergia frondosa (Poir.) Fern.

Weedy margins and alluvial woods,
632 feet to 644 feet

Islands: 2, 4, 7, 9, 10, 15, 16, 17, 18,
19, 21, 23

Collections: 616, 762, 2315, 2369, 2443, 2454,
2510, 2547, 2671, 2710, 2784, 2844, 2864,
2871, 2899, 2938, 2977, 3027, 3083

Table 1 (continued)

Muhlenbergia racemosa (Michx.) BSP.

Weedy margins and alluvial woods,
635 feet to 640 feet

Islands: 4, 22

Collections: 2453, 3109

Panicum capillare L.

Open areas, 632 feet to 648 feet

Islands: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11,
12, 14, 16, 17, 18, 19, 20

Collections: 421, 458, 586, 692, 754, 1912,
2004, 2074, 2112, 2146, 2306, 2308, 2355,
2396, 2405, 2418, 2432, 2444, 2507, 2549,
2580, 2615, 2673, 2694, 2725, 2735, 2766,
2823, 2829, 2842, 2891, 2906, 2944, 2964,
2991, 3061

Panicum dichotomiflorum Michx.

Open areas, 635 feet

Islands: 4, 14

Collections: 2768, 2829a

Panicum lanuginosum Ell. var.

implicatum (Scribn.) Fern.

Open areas, 637 feet

Island: 4

Collection: 1530

Panicum lanuginosum Ell. var.

septentrionale Fern.

Open areas, 633 feet

Island: 3

Collection: 1656

Panicum oligosanthos Schultes var.

schrubnerianum (Nash) Fern.

Open areas, 636 feet

Islands: 4, 12

Collections: 1202, 1533

Panicum virgatum L.

Open areas, 633 feet to 650 feet

Islands: 10, 11, 13, 14, 17, 20, 21, 22, 23

Collections: 261, 548, 1848, 1866, 2032, 2085,
2181, 2514, 2656, 2839, 3036

Table 1 (continued)

Paspalum ciliatifolium var.

stramineum (Nash) Fern

Open areas, 634 feet

Island: 20

Collection: 2030

Phalaris arundinacea L.

Moist sand of slough and river
shorelines, 633 feet

Islands: 4, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 16, 17, 18, 20, 21

Collections: 111, 133, 138, 276, 304, 491,
565, 604, 605, 748, 1063, 1088, 1111,
1156, 1163, 1198, 1205, 1227, 1243, 1281,
1327, 1337, 1358, 1384a, 1455, 2067

Phleum pratense L.

Dry open areas, 636 feet

Island: 12

Collection: 203

Phragmites australis (Cav.) Trin. ex Steud.

Moist sand of marshy borders, 632 feet

Islands: 2, 7, 10

Collections: 705, 2338, 2560

Poa compressa L.

Dry open areas, 636 feet

Islands: 8, 13

Collections: 1100, 1262, 1572, 1575

Poa palustris L.

Open areas, 636 feet

Island: 21

Collection: 1947

Poa pratensis L.

Dry open areas, 634 feet to 644 feet

Islands: 1, 2, 6, 7, 8, 9, 10, 11, 12, 13,
17, 18, 19, 21

Collections: 163, 202, 941, 960, 991, 1037,
1070, 1098, 1121, 1132, 1169, 1175, 1207,
1288, 1310, 1323, 1343, 1469

Table 1 (continued)

Setaria glauca (L.) Beauv.

Dry open areas, 636 feet

Islands: 6, 10, 11, 17, 18

Collections: 2505, 2647a, 2655, 2862, 2976

Setaria viridis (L.) Beauv.

Dry open areas, 634 feet to 646 feet

Islands: 1, 2, 7, 8, 9, 10, 11, 12, 16

Collections: 693, 721, 1690, 1812, 1819,
2331, 2357, 2424, 2583, 2647, 2653, 2684,
2738, 2885, 2886, 2924

Spartina pectinata Link

Moist sand along shores, 633 feet

Islands: 4, 8, 17

Collections: 2372, 2780, 2876

Sphenopholis intermedia Rydb.

Dry open areas, 634 feet to 644 feet

Islands: 1, 6, 7, 8, 17

Collections: 1387, 1411, 1419, 1453, 1484,
1561, 1600

Sporobolus cryptandrus (Torr.) Gray

Dry open areas, 634 feet to 650 feet

Islands: 1, 2, 4, 5, 7, 8, 9, 10, 11, 12,
13, 16, 17, 18, 19, 21, 22, 23

Collections: 327, 383, 428, 467, 544, 606,
659, 678, 725, 1490, 1535, 1560, 1631,
1730, 1800, 1851, 1869, 1905, 1914, 2084,
2421, 2452, 2513, 2528, 2548, 2598, 2604,
2631, 2663, 2693, 2762, 2872, 2879, 2926,
2957, 2981, 3018, 3112

Triplasis purpurea (Walt.) Chapm.

Dry open areas, 634 feet to 650 feet

Islands: 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13,
17, 18, 19, 20, 21, 22, 23

Collections: 694, 750, 2345, 2397, 2415, 2467,
2488, 2523, 2546, 2619, 2632, 2654, 2664, 2695,
2726, 2763, 2808, 2818, 2873, 2880, 2927, 2958,
2982, 3019, 3054, 3087, 3104, 3111

Iridaceae (Iris Family)

Iris virginica L.

var. shrevei (Small) E. Anders

Moist sand along river shorelines, 632 feet

Table 1 (continued)

Island: 6
Collection: 1435

Juncaceae (Rush Family)

Juncus dudleyi Wieg.

Moist sand of marshy borders, 632 feet

Islands: 4, 6, 7
Collections: 1422, 1449, 1552

Juncus effusus L.

Moist sand of marshy borders, 632 feet

Islands: 1, 7
Collections: 1432, 1592

Juncus nodosus L.

Moist sand of marshy borders, 632 feet

Islands: 6, 7
Collections: 395, 1431, 1461, 2320, 2367

Liliaceae (Lily Family)

Asparagus officinalis L.

Alluvial woods and weedy borders; 634 feet to 646 feet

Islands: 10, 20, 23
Collections: 719, 2041, 3079

Polygonatum canaliculatum (Muhl.) Pursh

Alluvial woods, 636 feet

Island: 20
Collection: 2052

Smilacina racemosa (L.) Desf.

Alluvial woods, 636 feet

Island: 12
Collection: 230

Smilacina stellata (L.) Desf.

Moist sand, Salix community, 632 feet

Island: 19
Collection: 951

Smilacaceae (Greenbrier Family)

Smilax hispida Muhl.

Alluvial woods, 633 feet to 648 feet

Islands: 10, 12, 13, 15, 16, 23
Collections: 614, 2629, 2754, 2814, 2856, 2898, 3082

Table 1 (continued)

Magnoliatae
Aceraceae (Maple Family)

Acer negundo L.

Alluvial woods

Islands: 4, 5, 6, 7, 8, 9, 10, 11, 13, 15, 17, 18,
21, 22

Collections: 17, 112, 122, 134, 176, 268, 343, 580,
685, 880, 888, 1035, 1047, 1066, 1127, 1150, 1183,
1240, 1279, 1328, 1355, 1397, 1470, 1497, 1981, 2100

Acer saccharinum L.

Alluvial woods

Islands: 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 15,
16, 17, 18, 19, 21, 22

Collections: 109, 151, 192, 282, 302, 482, 558, 642,
687, 700, 760, 879, 889, 911, 945, 987, 999, 1014,
1043, 1077, 1116, 1161, 1237, 1284, 1335, 1354, 1366,
1447, 2099

Acer sp. (Seedlings)

Moist sand, alluvial woods, Salix community,
634 feet

Islands: 9, 15, 18, 19, 22

Collections: 1245, 1246, 1889, 1930, 1991, 2683

Aizoaceae (Carpeweed Family)

Mollugo verticillata L.

Sandy open areas, 633 feet to 646 feet

Islands: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 17, 18, 19, 20, 21, 22, 23

Collections: 322, 423, 488, 522, 691, 734, 1176, 1221,
1302, 1318, 1339, 1409, 1467, 1487, 1521, 1564, 1617,
1643, 1659, 1673, 1681, 1775, 1806, 1837, 1878, 1892,
1901, 1921, 1923, 1949, 1990, 2017, 2070, 2109, 2119,
2125, 2142

Amaranthaceae (Amaranth Family)

Amaranthus retroflexus

Open area, 634 feet

Island: 18

Collection: 1986

Amaranthus tamariscinus Nutt.

Acnida tamariscina (Nutt.) Wood

Moist sand of slough and river shorelines, 634 feet

Islands: 1, 2, 3, 4, 7, 8, 11, 15, 17, 18, 19, 22

Table 1 (continued)

Collections: 2086, 2131, 2330, 2422, 2552, 2601,
2625, 2795, 2884, 2947a, 3005, 3124

Amaranthus tuberculatus (Moq.) Sauer

Acnida altissima Riddell

Moist sand of slough and river shorelines, 634 feet

Islands: 1, 2, 3, 6, 9, 10, 11, 12, 13, 14, 15, 18,
19, 20, 21, 22

Collections: 419, 424, 425, 426, 427, 429, 430, 431,
436, 547, 560, 561, 1632, 1654, 1691, 1697, 1768,
1960, 1984, 1985, 2025, 2130, 2144, 2145, 2152, 2499,
2535, 2538, 2686, 2708, 2715, 2729, 2821, 2837, 2946,
2947, 2988, 3004, 3028, 3058, 3124a

Froelichia floridana (Nutt.) Moq.

Dry weedy areas, 636 feet

Island: 13

Collection: 2192

Anacardiaceae (Cashew Family)

Rhus glabra L.

Dry open area bordering woods, 638 feet

Islands: 4, 8, 11, 13

Collections: 245, 305, 324, 582, 2189, 2425

Rhus typhina L.

Dry open area bordering woods, 638 feet

Islands: 4, 7, 22

Collections: 402, 927, 1525

Toxicodendron rydbergii Greene

Alluvial woods and dry open areas, 634 feet
to 650 feet

Islands: 3, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18,
19, 20, 21, 22, 23

Collections: 182, 239, 480, 626, 668, 1648, 1804, 2627,
2682, 2805, 2858, 2908, 2939, 2967, 2971, 3021, 3052,
3081, 3113

Apocynaceae (Dogbane Family)

Apocynum cannabinum L.

Moist sand bordering Salix community, 633 feet

Dry open areas, 646 feet

Islands: 3, 4, 10, 23

Collections: 1551, 1637, 1844, 2537

Table 1 (continued)

Asclepiadaceae (Milkweed Family)

Asclepias incarnata L.

Moist sand of shorelines, 633 feet

Islands: 1, 2, 3, 4, 5, 7, 9, 10, 11, 13, 17, 19, 21

Collections: 254, 258, 351, 376, 504, 585, 716, 1513,
1591, 1635, 1672, 1718, 1767, 1939, 1961, 2092, 2196, 2299

Asclepias syriaca L.

Dry open areas, 634 feet to 650 feet

Islands: 1, 2, 3, 4, 7, 8, 11, 12, 13

Collections: 217, 244, 349, 388, 521, 667, 1545, 1563,
1585, 1619, 1636, 1682, 1684, 1750, 1827, 2186

Asclepias verticillata L.

Dry weedy borders, 634 feet

Islands: 10, 13

Collections: 568, 2184, 2508

Balsaminaceae (Touch-me-not Family)

Impatiens biflora Walt.

Moist sandy to muddy alluvial forests, 632 feet

Islands: 2, 4, 7, 9, 16

Collections: 501, 609, 2363, 2459, 2559, 2704, 2705

Betulaceae (Birch Family)

Betula nigra L.

Alluvial woods, shorelines

Islands: 1, 3, 5, 8, 9, 10, 11, 12, 13, 15, 18, 19,
21, 22

Collections: 168, 227, 579, 682, 684, 890, 971, 984,
1074, 1110, 1159, 1193, 1235, 1286, 1331, 1510, 1933

Bignoniaceae (Bignonia Family)

Catalpa speciosa Warder

Moist to dry woods, weedy borders, 634 feet
to 638 feet

Islands: 17, 19, 22

Collections: 280, 1887, 1900

Boraginaceae (Borage Family)

Hackelia virginiana (L.) I. M. Johnston

Alluvial woods and thickets, 635 feet

Islands: 7, 16

Collections: 357, 622

Table 1 (continued)

Campanulaceae (Bluebell Family)

Campanula americana L.

Alluvial woods, 635 feet

Island: 16

Collections: 625, 627

Lobelia cardinalis L.

Moist sand of Salix communities, Phalaris
meadows along shorelines, 633 feet

Islands: 7, 11, 15, 20

Collections: 2055, 2136, 2322, 2659

Lobelia siphilitica L.

Moist sand bordering Salix communities, 633 feet

Islands: 6, 7

Collections: 2323, 2371, 2485

Cannabaceae (Hemp Family)

Cannabis sativa L.

Dry woods, 638 feet

Island: 20

Collection: 3065

Capparidaceae

Polanisia graveolens Raf.

Dry open areas, 634 feet to 650 feet

Islands: 1, 2, 7, 8, 9, 11, 12, 13, 16, 22

Collections: 287, 371, 456, 525, 594, 648, 1565,
1614, 1696, 1706, 1793, 1798, 1895, 2385, 2404,
2431

Caprifoliaceae (Honeysuckle Family)

Lonicera x bella Zabel

Dry wooded borders, 638 feet

Islands: 11, 17, 19, 22

Collections: 174, 906, 907, 912, 914, 936, 1395, 1885

Lonicera tatarica L.

Dry wooded borders, 638 feet

Islands: 19, 20, 21, 23

Collections: 933, 1315, 1852, 2043

Sambucus canadensis L.

Moist sand, alluvial woods, 634 feet

Islands: 3, 4, 6, 16, 18, 20, 21

Collections: 620, 1468, 1640, 1944, 1980, 2045, 2788

Table 1 (continued)

Caryophyllaceae (Pink Family)

Cerastium vulgatum L.

Weedy border of Salix communities, 635 feet

Islands: 4, 16

Collections: 348, 628

Lychnis alba Mill.

Dry open areas, 634 feet to 642 feet

Islands: 1, 4, 5, 8, 12, 16

Collections: 235, 306, 608, 1500, 1571, 1626, 2173

Myosoton aquaticum (L.) Moench

Stellaria aquatica (L.) Scop.

Moist alluvial woods and borders, 634 feet

Islands: 3, 11, 14, 18, 21, 22

Collections: 172, 1653, 1754, 1893, 1969, 1995, 2834

Saponaria officinalis L.

Dry open areas, 634 feet to 642 feet

Islands: 4, 5, 6, 8, 10, 20, 21

Collections: 303, 669, 720, 1485, 1515, 1582,
1724, 1951, 2053, 2414, 2489, 2516, 2777

Silene antirrhina L.

Dry open areas, 638 feet

Islands: 8, 10

Collections: 1579, 2635

Silene cserei Baumg.

Dry open areas, 640 feet

Islands: 8, 21, 22

Collections: 671, 1299, 1858

Stellaria media (L.) Cyrillo

Alluvial woods, 635 feet

Island: 16

Collection: 615

Celastraceae (Staff Tree Family)

Celastrus scandens L.

Dry woods and thicket borders, 636 feet to
650 feet

Islands: 10, 12, 13, 16, 20, 23

Collections: 231, 1223, 1254, 1747, 2628, 2749,
2750, 2813, 2901, 3062, 3100

Table 1 (continued)

Chenopodiaceae (Goosefoot Family)

Chenopodium album L.

Weedy areas, 633 feet to 650 feet

Islands: 1, 2, 3, 4, 6, 8, 9, 10, 11, 12, 13,
14, 15, 16, 18, 19, 20, 21, 23

Collections: 290, 437, 473, 595, 633, 717, 2401,
2426, 2465, 2476, 2530, 2550, 2590, 2596, 2610,
2630, 2679, 2707, 2736, 2743, 2767, 2782, 2810,
2817, 2828, 2852, 2883, 2913, 2923, 2943, 2987,
3042, 3064, 3077

Cycloloma atriplicifolium (Spreng.) Coult.

Dry open areas, 634 feet to 650 feet

Islands: 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 13, 17,
19, 23

Collections: 242, 320, 344, 373, 509, 524, 649, 673, 752,
1488, 1587, 1616, 1683, 1734, 1751, 1771, 1838, 1913,
2090, 2180, 2395, 2470

Salsola kali L.

var. tenuifolia G. F. W. Meyer

Dry open areas, 636 feet to 650 feet

Islands: 4, 8, 10, 13

Collections: 326, 342, 523, 670, 753, 1732, 2190, 2383,
2391, 2648, 2789, 2816

Compositae (Composite Family)

Achillea millefolium L.

Weedy borders and dry open areas,
633 feet to 642 feet

Islands: 1, 3, 6, 7, 8, 12, 13, 19, 21, 22

Collections: 223, 380, 570, 1297, 1413, 1480, 1574, 1612,
1649, 1857, 1911, 2183

Ambrosia artemisiifolia L.

Open areas, 633 feet to 650 feet

Islands: 1, 2, 4, 6, 8, 10, 11, 16, 19, 21, 22

Collections: 2403, 2435, 2487, 2515, 2553, 2591, 2639,
2764, 2881, 2903, 2928, 3015, 3050, 3107

Ambrosia trifida L.

Weedy areas, 633 feet

Islands: 2, 6

Collections: 2496, 2563

Table 1 (continued)

Artemisia biennis Willd.

Border of Salix communities, Phalaris
meadows, 634 feet

Islands: 14, 16

Collections: 2827, 2916

Artemisia ludoviciana Nutt.

Dry open areas, 636 feet

Island: 22

Collection: 3106

Artemisia serrata Nutt.

Dry open areas, 634 feet

Island: 1

Collection: 2589

Aster ericoides L.

Weedy borders, 633 feet

Island: 6

Collection: 2482

Aster novae-angliae L.

Dry sandy bank bordering thickets, 636 feet

Island: 22

Collection: 3108

Aster ontarionis Wieg.

Moist to dry alluvial woods and open areas,
633 feet to 640 feet

Islands: 6, 7, 9, 10, 13, 14, 15, 16, 17, 19, 20,
21, 23

Collections: 611, 2349, 2642, 2698, 2721, 2801,
2833, 2857, 2868, 2900, 2937, 3024a, 3055, 3096

Aster simplex Willd.

Moist sand of shorelines and open areas,
634 feet

Island: 19

Collection: 2963

Aster simplex Willd. var. simplex

Moist sand of shorelines and open areas,
634 feet

Islands: 1, 6, 9, 18

Collections: 2484, 2597, 2669, 2972

Table 1 (continued)

Bidens cernua L.

Moist sand of shorelines and marshy areas,
633 feet

Islands: 1, 2, 3, 4, 6, 9, 10, 12, 14, 16, 18,
20, 21, 22, 23

Collections: 733, 2438, 2463, 2536, 2557, 2574, 2606,
2611, 2667, 2689, 2716, 2717, 2720, 2756, 2758, 2796,
2825, 2911b, 2999, 3046, 3056, 3093, 3119

Bidens comosa (Gray) Wieg.

Border of Salix communities, 636 feet

Island: 14

Collection: 2825a

Bidens connata Muhl. var.

petiolata (Nutt.) Farw.

Moist sand of shorelines and marshy areas,
633 feet

Islands: 2, 6, 9, 10, 15, 16

Collections: 737, 2539, 2557a, 2689a, 2720a, 2851,
2911a

Bidens frondosa L.

Moist sand of shorelines and marshy areas,
633 feet

Islands: 2, 3, 4, 7, 8, 13, 14, 16, 18, 19, 20, 21

Collections: 537, 2365, 2382, 2556, 2613, 2798, 2836,
2911, 2961, 2994, 3045, 3059

Bidens vulgata Greene

Border of Salix communities, 636 feet

Island: 14

Collection: 2836a

Cirsium arvense (L.) Scop.

Open areas and weedy borders, 634 feet

Islands: 1, 2, 4, 7, 14

Collections: 1540, 1625, 1688, 2151, 2350

Cirsium vulgare (Savi) Tenore

Open areas, weedy borders, and alluvial
woods, 634 feet to 640 feet

Islands: 7, 9, 10, 13, 16

Collections: 378, 478, 567, 647, 2159, 2170, 2531, 2894

Table 1 (continued)

Erechtites hieracifolia (L.) Raf.

Alluvial woods, 634 feet

Islands: 3, 9, 12, 16, 17, 21

Collections: 2607, 2709, 2755, 2859, 2897, 3047

Erigeron annuus (L.) Pers.

Moist to dry weedy borders and open areas,
632 feet to 642 feet

Islands: 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 17, 19,
20, 21, 22

Collections: 188, 211, 269, 573, 1196, 1295, 1459,
1501, 1604, 1651, 1700, 1719, 1818, 1871, 1925,
2051, 2723, 2753, 2770, 3024, 3026

Erigeron canadensis L.

Conyza canadensis (L.) Cron.

Weedy borders and dry open areas,
632 feet to 646 feet

Islands: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14,
15, 16, 17, 18, 19, 21, 22, 23

Collections: 323, 341, 368, 386, 410, 422, 460, 536,
607, 651, 674, 1772, 1820, 1873, 1903, 1922, 1954,
2114, 2171, 2187, 2309, 2394, 2406, 2429, 2442, 2509,
2527, 2544, 2595, 2614, 2665, 2718, 2773, 2822, 2847,
2887, 2942, 2975, 3076

Erigeron philadelphicus L.

Alluvial woods, 632 feet to 635 feet

Islands: 7, 11, 18

Collections: 185, 1267, 1270, 1415

Erigeron strigosus Muhl.

Weedy borders and dry open areas, 633 feet
to 642 feet

Islands: 4, 7, 8, 9, 10, 12

Collections: 225, 338, 403, 454, 688, 711, 1516, 1569, 1809

Eupatorium maculatum L.

Moist alluvial woods and borders, 633 feet

Islands: 4, 7, 9, 16

Collections: 438, 439, 612, 2169, 2325, 2474

Eupatorium perfoliatum L.

Moist sand of marshy areas and Salix
borders, 633 feet

Islands: 1, 3, 6, 7, 9, 14

Collections: 372, 511, 2153, 2324, 2493, 2584, 2616

Table 1 (continued)

Eupatorium rugosum Houtt.

Alluvial woods, 634 feet to 646 feet

Islands: 8, 9, 10, 12, 16, 17, 19, 20, 22, 23

Collections: 618, 624, 655, 722, 2427, 2520, 2637,
2643, 2662, 2745, 2865, 2895, 2935, 3066, 3074, 3102

Galinsoga ciliata (Raf.) Blake

Moist sand of Salix communities and
Phalaris meadows, 634 feet

Island: 20

Collection: 2060

Gnaphalium obtusifolium L.

Dry open areas, 640 feet

Island: 22

Collection: 3105

Helenium autumnale L.

Moist borders of alluvial woods and Salix
communities, 634 feet

Islands: 1, 4, 6, 7, 10, 17, 18, 19, 20, 21

Collections: 708, 2317, 2581, 2719, 2759, 2866,
2931, 2973, 3023, 3068

Heliopsis helianthoides (L.) Sweet

Dry sandy Salix communities, 636 feet

Island: 13

Collection: 2195

Lactuca biennis (Moench) Fern.

Alluvial woods, 635 feet

Island: 16

Collection: 621

Lactuca canadensis L.

Dry weedy borders and open areas,
635 feet to 640 feet

Islands: 4, 7, 10, 12, 13, 16, 17, 20, 22, 23

Collections: 637, 2046, 2351, 2446, 2638, 2748, 2787,
2790, 2806, 2968, 3051, 3085, 3103

Lactuca scariola L.

Dry weedy borders and open areas,
634 feet to 648 feet

Islands: 2, 4, 7, 8, 9, 10, 12, 13, 16, 23

Collections: 325, 385, 543, 676, 723, 2191, 2407, 2423,
2562, 2677, 2731, 2746, 2791, 2811, 2902, 3085a

Table 1 (continued)

Rudbeckia laciniata L.

Alluvial woods, 635 feet

Island: 16

Collections: 617, 2168, 2909

Solidago altissima L.

Solidago canadensis L. var. scabra (Muhl.) T. & G.

Open areas and weedy borders, 634 feet

Islands: 1, 2, 3, 4, 10, 21

Collections: 2564, 2600, 2617, 2641, 2760, 3017a

Solidago canadensis L. var. hargeri Fern.

Open areas, 636 feet

Island: 10

Collection: 2511a

Solidago gigantea Ait. var. gigantea

Open areas and weedy borders, 634 feet
to 640 feet

Islands: 4, 6, 8, 10, 18, 19, 21

Collections: 2379, 2447, 2492, 2511, 2940, 2974, 3017

Solidago gigantea Ait. appr. var. gigantea

Open areas and weedy borders, 634 feet
to 640 feet

Islands: 1, 10, 22

Collections: 726, 2600a, 3101

Solidago gigantea Ait. var. serotina (Kuntze)

Cron.

Open areas and weedy borders, 634 feet
to 640 feet

Islands: 4, 7, 8, 9, 10, 12, 17, 20, 23

Collections: 289, 384, 472, 660, 698, 2300, 2416,
2428, 2651, 2676, 2734, 2760a, 2870, 3053, 3097

Tanacetum vulgare L.

Weedy borders, 633 feet

Island: 6

Collection: 2498

Taraxacum officinale Weber

Moist to dry, shorelines and open areas,
632 feet to 646 feet

Islands: 2, 3, 4, 7, 8, 11, 13, 16, 19, 22

Collections: 92, 93, 94, 95, 96, 101, 102, 103, 896, 922,
940, 978, 995, 1018, 1029, 1064, 1105, 1194, 1372

Table 1 (continued)

Tragopogon dubius Scop.

Dry open areas, 642 feet

Islands: 8, 10, 11, 12, 13, 22

Collections: 173, 526, 1090, 1145, 1181, 1222, 1879, 2408

Xanthium strumarium L.

Dry open areas, 634 feet to 642 feet

Islands: 1, 2, 4, 6, 7, 8, 9, 12, 13, 14, 17, 18,
19, 21, 22

Collections: 704, 2297, 2358, 2386, 2420, 2504, 2551,
2594, 2711, 2757, 2799, 2804, 2831, 2869, 2875, 2934,
2962, 3003, 3039, 3120

Convolvulaceae (Convolvulus Family)

Convolvulus sepium L.

Open areas, 634 feet to 644 feet

Islands: 1, 3, 4, 5, 6, 8, 9, 11, 12, 15, 16, 18, 19

Collections: 241, 474, 597, 1476, 1486, 1539, 1570,
1629, 1642, 1825, 1937, 1996, 2124

Cornaceae (Dogwood Family)

Cornus obliqua Raf.

Shorelines and borders of alluvial woods, 633 feet

Islands: 4, 5, 6, 7, 8, 9, 10, 11, 12, 16

Collections: 152, 169, 221, 317, 358, 497, 686, 764,
1383, 1402, 1442, 1512

Cornus rugosa Lam.

Alluvial woods, 638 feet

Island: 8

Collection: 1101

Cornus stolonifera Michx.

Shorelines and borders of alluvial woods, 633 feet

Islands: 1, 3, 4, 12, 13, 15, 17

Collections: 576, 969, 982, 1030, 1241, 1396, 1519,
1608, 1671, 1803

Crassulaceae (Orpine Family)

Sedum sarmentosum Bunge

Open areas, 634 feet

Island: 21

Collection: 1316

Table 1 (continued)

Cruciferae (Mustard Family)

Barbarea vulgaris R. Br.

Moist sand of slough and river shorelines, 633 feet

Islands: 1, 2, 4, 5, 9, 11, 12, 18, 19, 21

Collections: 120, 140, 141, 234, 292, 942, 966,
989, 1019, 1036, 1109, 1268, 1313, 1503

Berteroa incana (L.) DC.

Dry open areas, 636 feet

Island: 8

Collection: 1556

Brassica nigra (L.) Koch

Moist open areas and shorelines, 633 feet

Islands: 1, 6, 10, 11, 14, 16

Collections: 215, 1605, 1736, 2154, 2166, 2494

Capsella bursa-pastoris (L.) Medic.

Moist open areas along sloughs, 632 feet

Island: 11

Collection: 100

Cardamine pennsylvanica Muhl.

Alluvial woods, shorelines, 633 feet

Islands: 1, 3, 11, 12, 15, 17, 18, 21

Collections: 99, 144, 961, 975, 1244, 1272, 1293,
1312, 1338, 1596, 1668, 1810

Erysimum cheiranthoides L.

Weedy open areas and borders, 634 feet to
642 feet

Islands: 4, 6, 7, 8, 9, 10, 11, 17, 19, 22, 23

Collections: 162, 186, 263, 288, 363, 653, 718, 924,
950, 1052, 1134, 1392, 1477, 1478, 1726, 1791, 1829,
1876, 1881, 1910, 2116, 2495

Lepidium densiflorum Schrad.

Dry open areas, 634 feet to 646 feet

Islands: 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 17,
19, 21, 23

Collections: 148, 198, 262, 505, 943, 1027, 1082, 1106,
1139, 1168, 1192, 1209, 1305a, 1344, 1412, 1492, 1655,
1817, 1836, 1924, 1945

Table 1 (continued)

Lepidium virginicum L.

Dry open areas, 634 feet to 646 feet

Islands: 1, 4, 6, 7, 8, 9, 10, 13, 17, 21, 22

Collections: 301, 340, 366, 367, 533, 650, 672, 695, 724,
1195, 1305, 1408, 1466, 1613, 1859, 2111, 2389, 2680

Rorippa palustris (L.) Bess. ssp. glabra

(O.E.Schulz) Stuckey var. fernaldiana (Butt. & Abbe) Stuckey

Moist sand of shorelines, 633 feet

Islands: 1, 2, 6, 7, 8, 10, 11, 12, 13, 14, 16, 17,
18, 21

Collections: 118, 143, 213, 391, 534, 602, 1086, 1158, 1233,
1292, 1340, 1381, 1414, 1460, 1602, 1694, 1756, 1805, 1966,
1989, 2021, 2115, 3011

Sisymbrium altissimum L.

Dry open areas, 636 feet

Island: 7

Collection: 1038

Cucurbitaceae (Gourd Family)

Echinocystis lobata (Michx.) T. & G.

Alluvial woods and borders, 634 feet

Islands: 4, 6, 15, 16, 18, 20, 21

Collections: 592, 1987, 2040, 2448, 2501, 2776,
2843, 2919, 2986, 3049

Sicyos angulatus L.

Alluvial woods and borders, 634 feet

Islands: 4, 6, 9, 12, 14, 16, 19, 20, 22, 23

Collections: 311, 631, 2165, 2472, 2500, 2712,
2730, 2772, 2835, 2893, 2920, 2953, 3060,
3099, 3117

Cuscutaceae (Dodder Family)

Cuscuta sp.

On various herbs and shrubs, Solidago, Lycopus, Salix

Islands: 1, 2, 4, 7, 9, 17, 18

Collections: 2303, 2327, 2328, 2473, 2568, 2587, 2588,
2713, 2779, 2969, 2992

Euphorbiaceae (Spurge Family)

Acalypha rhomboidea Raf.

Weedy areas, 633 feet to 638 feet

Islands: 6, 14, 20, 22

Collections: 2486, 2826, 3069, 3122

Table 1 (continued)

Euphorbia maculata L.

Dry weedy and open areas, 634 feet to 640 feet

Islands: 2, 4, 6, 7, 12, 19, 21

Collections: 346, 1797, 1918, 2296, 2361, 2436, 2483,
2545, 2727, 2794, 2959, 3016

Euphorbia supina Raf.

Dry open areas, 634 feet to 640 feet

Islands: 1, 3, 8, 17, 18, 19, 20, 21, 22

Collections: 696, 1618, 1644, 1875, 1902, 1957, 2010,
2048, 2110

Fagaceae (Beech Family)

Quercus bicolor Willd.

Alluvial woods, Salix communities, 633 feet to
640 feet

Islands: 9, 10, 11, 12, 17, 19

Collections: 229, 243, 481, 727, 1115, 1148, 1353,
1398, 1929, 2096, 2633, 2703, 2739, 2936, 2970

Quercus velutina Lam.

Dry open areas and borders, 636 feet to
648 feet

Islands: 11, 12, 13, 16, 19, 20, 21, 22

Collections: 150, 206, 581, 895, 918, 1200, 2733,
2802, 2812, 2896, 2952, 3020, 3063, 3110

Geraniaceae (Geranium Family)

Geranium carolinianum L

Dry open areas, 644 feet

Island: 13

Collections: 1177, 1178

Juglandaceae (Walnut Family)

Juglans nigra L.

Alluvial woods, 636 feet

Islands: 9, 12

Collections: 238, 1128, 1802, 2751

Labiatae (Mint Family)

Glechoma hederacea L. var. parviflora Druce

Alluvial woods, 633 feet

Island: 11

Collection: 129

Table 1 (continued)

Hedeoma hispida Pursh

Open sandy areas, 638 feet

Island: 21, 22

Collections: 1294, 1874, 1955

Lycopus americanus Muhl

Salix communities and shorelines, 634 feet

Islands: 1, 4, 7, 9, 10, 11, 13, 16, 20, 21

Collections: 247, 352, 374, 406, 464, 572, 729,
1601, 1721, 1763, 1967, 2059, 2177, 2197, 2310,
2326, 2640

Lycopus virginicus L.

Salix communities and shorelines, 634 feet

Islands: 7, 8, 10, 13

Collections: 709, 2199, 2298a, 2375

Mentha arvensis L.

Salix communities and shorelines, 634 feet

Islands: 7, 9, 10, 13, 16, 17, 19, 21

Collections: 281, 387, 411, 413, 444, 445, 446,
552, 553, 731, 1938, 1972, 2104, 2176, 2198, 2298

Monarda punctata L.

Dry open areas, 634 feet to 646 feet

Islands: 1, 12, 16, 21, 22, 23

Collections: 1863, 1952, 2172, 2592, 2747, 3073

Nepeta cataria L.

Dry open areas, 634 feet to 640 feet

Islands: 7, 10

Collections: 355, 1749

Physostegia formosior Lunell

Salix communities and shorelines, 633 feet

Islands: 3, 7, 8, 9, 13, 18, 19

Collections: 495, 569, 2200, 2354, 2376, 2624,
2955, 3000

Scutellaria galericulata L.

(Scutellaria epilobiifolia A. Hamilton)

Salix communities and shorelines, 633 feet

Islands: 6, 7

Collections: 414, 1434, 2340

Table 1 (continued)

Scutellaria lateriflora L.

Salix communities and shorelines, 633 feet

Islands: 4, 6, 7, 9, 10, 13, 16, 17, 19

Collections: 414a, 462, 470, 550, 629, 738, 739,
2105, 2175, 2204, 2304, 2456, 2668, 2722, 2954

Stachys hispida Pursh

Salix communities and shorelines, 633 feet

Islands: 2, 6, 7, 9, 12, 13, 15, 16, 18, 20, 21

Collections: 408, 442, 443, 463, 551, 630, 1702,
1796, 1963, 2007, 2081, 2129, 2140, 2178, 2490,
2555

Stachys tenuifolia Willd.

Alluvial woods, 636 feet

Island: 10

Collection: 2646

Teucrium canadense L. var. virginicum (L.) Eat.

Moist to dry alluvial woods and weedy
borders, 633 feet to 646 feet

Islands: 2, 4, 8, 9, 12, 13, 16, 17, 19, 20,
21, 22, 23

Collections: 283, 334, 336, 1514, 1695, 1707,
1784, 1801, 1826, 1828, 1842, 1864, 1883, 1896,
1962, 2042, 2164, 2188, 2417

Leguminosae (Pulse Family)

Amorpha fruticosa L.

Shorelines and borders of alluvial woods, 633 feet

Islands: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
14, 15, 21

Collections: 136, 153, 204, 345, 347, 359, 412, 477,
499, 554, 701, 714, 967, 986, 994, 1016, 1049, 1073,
1095, 1118, 1146, 1197, 1214, 1224, 1250, 1309, 1458, 1511

Apios americana Medic.

Border of alluvial woods, 634 feet

Islands: 3, 16

Collections: 2608, 2910

Astragalus canadensis L.

Borders of alluvial forest, 636 feet

Island: 9

Collection: 1792

Table 1 (continued)

Lathyrus palustris L.

Moist sand of Salix communities, 632 feet

Island: 7

Collection: 1416

Medicago lupulina L.

Weedy borders of alluvial woods, 636 feet

Islands: 8, 10, 11, 12

Collections: 171, 232, 1160, 1578

Melilotus alba Desr.

Dry open areas, 634 feet to 650 feet

Islands: 4, 6, 7, 8, 9, 10, 11, 12, 13, 16, 17, 19

Collections: 170, 187, 220, 284, 328, 415, 510, 538, 635,
654, 677, 712, 1187, 1475, 1543, 1557, 1722, 1753, 1907, 2388

Melilotus officinalis (L.) Lam.

Dry open areas, 634 feet to 644 feet

Islands: 4, 8, 10, 12, 13, 16

Collections: 190, 224, 1157, 1185, 1374, 1544,
1546, 1580, 1821

Robinia pseudo-acacia L.

Dry borders of alluvial woods, 638 feet

Islands: 4, 8, 11, 16

Collections: 154, 662, 1093, 1377, 2783

Strophostyles helvola (L.) Ell.

Open dry areas, 634 feet to 638 feet

Islands: 2, 4, 8, 19

Collections: 1897, 2374, 2469, 2566, 2781

Trifolium pratense L.

Weedy borders of alluvial woods, 636 feet

Island: 11

Collection: 159

Trifolium repens L.

Open areas and weedy borders, 632 feet to
646 feet

Islands: 4, 7, 10, 11, 18

Collections: 146, 1289, 1423, 1547, 1728, 1757

Malvaceae (Mallow Family)

Abutilon theophrasti Medic.

Weedy borders of shores and alluvial woods,
634 feet

Table 1 (continued)

Islands: 9, 14, 16
Collections: 2706, 2840, 2925

Menispermaceae (Moonseed Family)

Menispermum canadense L.

Alluvial woods, 636 feet

Islands: 9, 12, 13, 23
Collections: 1259, 2691, 2752, 3086

Moraceae (Mulberry Family)

Morus alba L.

Alluvial woods

Islands: 2, 3, 4, 10, 11, 13, 19, 21, 22
Collections: 161, 299, 583, 742, 908, 913, 919,
920, 983, 1006, 1024, 1258, 1336, 2966

Nyctaginaceae (Four-o'clock Family)

Mirabilis nyctaginea (Michx.) MacM.

Dry open and weedy areas, 634 feet to
644 feet

Islands: 2, 4, 8, 9, 11, 12, 13, 21
Collections: 164, 181, 218, 295, 468, 1104, 1108,
1180, 1219, 1308, 1534, 1711

Oleaceae (Olive Family)

Fraxinus pennsylvanica Marsh

Alluvial woods

Islands: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
15, 16, 17, 19, 20, 21, 22, 23
Collections: 123, 165, 207, 226, 361, 500, 556, 640,
681, 757, 878, 886, 946, 973, 985, 1007, 1010, 1028,
1044, 1092, 1123, 1174, 1188, 1220, 1234, 1330, 1252,
1367, 1471, 1509, 1845, 2044

Onagraceae (Evening Primrose Family)

Epilobium glandulosum Lehm.

Moist sand of Salix communities, 633 feet

Island: 7
Collections: 416, 2352

Oenothera biennis L. var. caeciarum Munz.

Dry open areas and weedy borders, 634 feet to
650 feet

Islands: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 16,
17, 18, 19, 20, 21

Table 1 (continued)

Collections: 246, 265, 353, 389, 506, 507, 508, 542,
591, 610, 634, 656, 765, 2179, 2301, 2346, 2368,
2384, 2413, 2433, 2450, 2471, 2491, 2497, 2512,
2524, 2542, 2561, 2599, 2618, 2660, 2661, 2737,
2765, 2807, 2819, 2860, 2890, 2917, 2932, 2984,
3001, 3043, 3067

Oenothera rhombipetala Nutt.

Dry open areas, 648 feet

Island: 19

Collection: 1916

Oxalidaceae (Wood Sorrel Family)

Oxalis europaea Jord.

Weedy borders of alluvial woods and Salix
communities, 634 feet to 650 feet

Islands: 1, 4, 7, 9, 11, 16, 17, 18, 19, 20, 21, 23

Collections: 177, 300, 449, 1370, 1390, 1400, 1527,
1609, 1854, 1909, 1931, 1946, 1970, 1983, 2012, 2036

Oxalis stricta L.

Weedy borders of alluvial woods and Salix
communities, 634 feet to 642 feet

Islands: 3, 8, 14, 18, 21, 22

Collections: 1103, 1229, 1274, 1287, 1298, 1304,
1667, 1867

Plantaginaceae (Plantain Family)

Plantago major L.

Moist sand of Salix communities, 633 feet

Islands: 7, 11, 14, 17

Collections: 249, 2106, 2149, 2344, 2366

Plantago rugelii Dcne.

Moist sand of Salix communities, 633 feet

Island: 13

Collection: 535

Polygonaceae (Buckwheat Family)

Polygonum aviculare L.

Dry open areas, 634 feet

Island: 9

Collection: 457

Polygonum coccineum Muhl.

Border of Phalaris meadows along sloughs, 634 feet

Table 1 (continued)

Island: 16
Collection: 589

Polygonum erectum L.

Dry open areas, 634 feet to 640 feet

Islands: 4, 10, 13, 16
Collections: 2529, 2775, 2800, 2915

Polygonum hydropiper L.

Moist sand bordering Salix communities, 633 feet

Islands: 4, 10
Collections: 2652, 2769

Polygonum lapathifolium L.

Moist sand bordering marshes and shorelines,
634 feet

Islands: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 14,
16, 18, 20, 21, 22
Collections: 253, 392, 465, 486, 603, 689, 735, 1689,
1742, 2003, 2018, 2075, 2148, 2157, 2174, 2302,
2313, 2341, 2377, 2419, 2477, 2534, 2543, 2569,
2577, 2626, 2666, 2690, 2696, 2741, 2797, 2824, 2888,
2912, 2989, 3030, 3118

Polygonum pennsylvanicum L.

Moist sand bordering marshes and shorelines,
634 feet

Islands: 1, 4, 7, 9, 12, 14, 15, 16, 19, 21, 22
Collections: 2148a, 2174a, 2302a, 2585, 2675, 2687,
2696a, 2740, 2774, 2850, 2907, 2918, 2948, 3030a,
3118a

Polygonum punctatum Ell.

Moist alluvial woods, shores, 633 feet

Islands: 1, 4, 21, 23
Collections: 2455, 2572, 3037, 3090

Polygonum scandens L.

Dry open areas and weedy borders, 634 feet to
640 feet

Islands: 2, 3, 4, 6, 8, 9, 10, 11, 12, 13, 16, 17,
19, 23
Collections: 466, 545, 546, 632, 690, 745, 2193, 2393,
2412, 2434, 2441, 2480, 2519, 2565, 2620, 2636, 2678,
2699, 2732, 2792, 2809, 2861, 2889, 2905, 2914, 2965, 3075

Rumex acetosella L.

Open areas, 634 feet

Table 1 (continued)

Islands: 1, 2, 4, 6

Collections: 962, 990, 1473, 1623, 1710, 2468

Rumex crispus L.

Weedy borders and moist sand of slough and river shorelines, 634 feet

Islands: 2, 7, 8, 9, 10, 11, 12, 13, 17, 19, 22

Collections: 98, 139, 210, 398, 469, 540, 541, 1577, 1699, 1725, 1735, 1787, 1807, 1860, 1908, 2101, 2201, 2518

Rumex mexicanus Meisn.

Moist sand of river shorelines, 633 feet

Island: 9

Collection: 1788

Rumex orbiculatus Gray

Moist sandy to muddy border of sloughs, 632 feet

Island: 1

Collection: 2576

Rumex patientia L.

Moist sand, weedy border of Salix communities, 634 feet

Island: 17

Collection: 257

Rumex verticillatus L.

Moist sand bordering shorelines, 633 feet

Islands: 11, 20

Collections: 214, 2056

Primulaceae (Primrose Family)

Lysimachia ciliata L.

Alluvial woods, 636 feet

Islands: 4, 12, 19, 23

Collections: 293, 1794, 1830, 1898

Lysimachia hybrida Michx.

Alluvial woods, 636 feet

Island: 21

Collection: 3048

Lysimachia terrestris (L.) BSP.

Moist sand of Salix communities, 632 feet

Island: 1

Collection: 1621

Table 1 (continued)

Ranunculaceae (Crowfoot Family)

Anemone canadensis L.

Salix communities, 637 feet

Island: 18

Collection: 2011

Ranunculus abortivus L.

Alluvial woods, 636 feet

Islands: 11, 12, 13, 22

Collections: 128, 233, 909, 1165, 1261

Ranunculus pennsylvanicus L. f.

Moist sand of marshy borders, 633 feet

Islands: 1, 7, 9, 12, 17

Collections: 405, 441, 1603, 1813, 2102, 2359

Rosaceae (Rose Family)

Geum laciniatum Murr.

Moist sand of alluvial woods and borders, 633 feet

Islands: 4, 7, 8, 11, 17

Collections: 184, 297, 313, 1391, 1406, 1517, 1559, 2439

Potentilla argentea L.

Open dry areas, 636 feet

Island: 21

Collection: 1306

Potentilla norvegica L.

Dry open areas and weedy borders, 634 feet

Islands: 1, 2, 3, 4, 6, 7, 9, 10, 11, 13, 17, 22

Collections: 97, 212, 264, 277, 407, 450, 549,
1417, 1483, 1520, 1615, 1650, 1705, 1740, 1872,
2362, 2803

Prunus americana Marsh.

Alluvial woods, 640 feet

Island: 11

Collection: 216

Prunus serotina Ehrh.

Alluvial woods, 638 feet

Islands: 8, 10, 11, 12

Collections: 149, 1097, 1213, 1746

Table 1 (continued)

Prunus virginiana L.

Alluvial woods, 635 feet

Island: 4

Collection: 1025

Rosa acicularis Lindl.

Dry open areas, 636 feet

Island: 21

Collection: 1314

Rosa blanda Ait.

Alluvial woods, 636 feet

Islands: 9, 10, 13

Collections: 475, 1112, 1136, 1182

Rubus flagellaris L.

Open dry areas, 635 feet

Island: 3

Collections: 988, 1693

Rubus occidentalis L.

Weedy borders of alluvial woods, 638 feet

Islands: 2, 4, 5, 7, 8, 10, 11, 12, 19, 22, 23

Collections: 156, 205, 237, 298, 354, 661, 947, 1046,
1065, 1133, 1405, 1496, 1538, 1704, 1862, 3098

Rubiaceae (Madder Family)

Cephalanthus occidentalis L.

Moist shores

Islands: 3, 4, 7, 9, 10, 12, 16, 19

Collections: 309, 356, 479, 1670, 1745, 1773, 1816,
1934, 2160

Galium aparine L.

Moist sand of thickets and alluvial woods, 633 feet

Islands: 4, 11, 17, 19

Collections: 125, 131, 952, 1023, 1357

Galium obtusum Bigel.

Moist sand of thickets and alluvial woods, 633 feet

Islands: 1, 4, 6, 7, 8, 11, 17, 21, 22

Collections: 183, 291, 1317, 1349, 1401, 1452, 1518,
1566, 1620, 1882

Table 1 (continued)

Galium tinctorium L.

Moist sand of Salix communities, 633 feet

Island: 7

Collections: 401, 1430

Salicaceae (Willow Family)

Populus deltoides Marsh.

Alluvial woods

Islands: 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,
16, 17, 18, 19, 21, 22

Collections: 113, 166, 197, 228, 270, 296, 315, 365, 575,
665, 741, 901, 931, 997, 1032, 1058, 1068, 1120, 1149,
1226, 1251, 1275, 1334, 1380, 1424, 1479, 1499, 1536,
2026

Salix amygdaloides Anders.

Moist shores

Islands: 2, 4, 7, 8, 10, 11, 12, 13, 15, 17, 19, 21, 22

Collections: 114, 115, 117, 193, 331, 703, 715, 883, 894,
928, 1004, 1033, 1067, 1151, 1239, 1252, 1260, 1332, 1388,
1426, 1884

Salix fragilis L.

Moist shores

Island: 16

Collection: 1361

Salix interior Rowlee

Moist shores

Islands: 2, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16,
17, 18, 19, 20, 21, 22

Collections: 18, 116, 137, 259, 260, 333, 409, 484, 559,
590, 763, 885, 887, 948, 1003, 1008, 1011, 1051, 1054,
1056, 1057, 1089, 1124, 1130, 1131, 1135, 1152, 1171,
1173, 1191, 1203, 1206, 1228, 1230, 1253, 1255, 1269,
1273, 1277, 1324, 1325, 1346, 1347, 1363, 1375, 1376,
1463, 1464, 1815, 1915, 2009, 2061, 2062, 2097

Salix nigra Marsh.

Moist shores

Islands: 2, 6, 7, 8, 12, 16, 19, 20

Collections: 191, 644, 664, 953, 1002, 1055, 1091,
1362, 1440, 2063

Table 1 (continued)

Salix rigida Muhl.

Moist shores

Island: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 17
Collections: 121, 178, 271, 339, 476, 702, 743,
759, 965, 974, 980, 1000, 1005, 1021, 1048,
1122, 1218, 1348, 1448, 2098

Saxifragaceae (Saxifrage Family)

Penthorum sedoides L.

Moist sand, alluvial woods and Salix communities,
633 feet

Islands: 4, 7, 20
Collections: 399, 2058, 2316, 2326, 2348, 2457

Ribes americanum Mill.

Alluvial woods and moist weedy borders, 634 feet

Islands: 7, 9, 11, 12, 13, 16, 17, 19, 22
Collections: 110, 126, 236, 266, 496, 574, 619, 882,
900, 902, 904, 921, 932, 934, 954, 1053, 1125, 1356,
1373, 1404, 2095

Scrophulariaceae (Figwort Family)

Gerardia tenuifolia Vahl

Moist sandy areas bordering shorelines, 633 feet

Islands: 6, 7, 8, 9, 10
Collections: 710, 2307, 2364, 2373, 2481, 2506, 2540, 2670

Linaria canadensis (L.) Dumont

Dry open areas, 646 feet

Islands: 19, 22, 23
Collections: 899, 956, 1839, 1841, 1861

Linaria vulgaris Hill

Weedy borders of woods and thickets, 633 feet to
642 feet

Islands: 6, 7, 9, 10, 13, 18, 19, 21, 22
Collections: 375, 1436, 1783, 1856, 1906, 1950, 2182,
2517, 2983

Lindernia dubia (L.) Pennell

Moist sand of shorelines, 633 feet

Islands: 1, 3, 6, 7, 10, 15, 16, 17, 18, 20, 21
Collections: 393, 600, 1438, 1597, 1622, 1699, 1743,
1968, 2023, 2071, 2108, 2127

Table 1 (continued).

Mimulus ringens L.

Moist sand of Salix communities and shorelines,
633 feet

Islands: 1, 7, 10, 11, 12, 15, 17, 19, 20, 21

Collections: 248, 396, 707, 1598, 1741, 1814, 1936,
1941, 1959, 2037, 2103, 2132

Scrophularia marilandica L.

Alluvial woods, 635 feet

Islands: 4, 16, 23

Collections: 312, 623, 3095

Verbascum thapsus L.

Dry open areas, 636 feet to 646 feet

Islands: 4, 7, 8, 10, 12, 13, 22, 23

Collections: 219, 321, 400, 520, 1568, 1748, 1824,
1833, 1855

Veronica peregrina L. var. peregrina

Moist sand of shorelines, 634 feet

Islands: 6, 11, 13, 14, 18

Collections: 105, 1167, 1199a, 1231, 1285, 1482a

Veronica peregrina L.

var. xalapensis (HBK) Pennell

Moist sand of shorelines, 634 feet

Islands: 1, 4, 6, 8, 10, 11, 13, 17, 18, 19, 21, 22

Collections: 105a, 925, 955, 964, 1031, 1079, 1140,
1199, 1290, 1296, 1342, 1482

Solanaceae (Nightshade Family)

Solanum carolinense L.

Dry open areas, 636 feet

Islands: 4, 8

Collections: 1541, 1558, 1581

Solanum dulcamara L.

Dry open areas, thickets, and alluvial woods,
633 feet to 646 feet

Islands: 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,
16, 17, 18, 19, 20, 21, 23

Collections: 107, 142, 147, 194, 267, 335, 360, 502,
577, 593, 636, 652, 744, 938, 1034, 1050, 1071, 1117,
1147, 1170, 1189, 1208, 1225, 1249, 1271, 1329, 1345,
1360, 1465, 1498, 1595, 1843, 1940, 1971, 2008, 2080,
2118, 2392, 2685

Table 1 (continued).

Solanum nigrum L.

Moist sand of alluvial woods and borders, 634 feet

Islands: 2, 3, 4, 8, 9, 10, 11, 14, 16, 17, 18, 19,
20, 21, 22

Collections: 420, 601, 751, 1657, 1675, 1779, 1880,
1965, 1982, 2020, 2038, 2091, 2147, 2430, 2609,
2778, 2830, 2863, 2933, 2941, 2985, 3032

Tiliaceae (Linden Family)

Tilia americana L.

Alluvial woods

Islands: 7, 11

Collections: 180, 1403

Ulmaceae (Elm Family)

Celtis occidentalis L.

Alluvial woods

Islands: 5, 11, 16, 20, 22, 23

Collections: 179, 903, 1385, 1495, 1846, 2050, 3080

Ulmus americana L.

Alluvial woods

Islands: 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,
16, 17, 18, 19, 21, 22, 23

Collections: 130, 167, 195, 196, 279, 307, 310, 483,
498, 557, 578, 641, 643, 666, 755, 756, 881, 893, 905,
915, 916, 930, 949, 981, 1001, 1015, 1045, 1119, 1142,
1162, 1216, 1217, 1236, 1238, 1247, 1280, 1282, 1326,
1365, 1368, 1394, 1441, 1446, 1454, 1638, 1664, 1847,
1888, 1899, 1920, 2832, 2874

Umbelliferae (Parsley Family)

Cicuta bulbifera L.

Open marshy areas, 632 feet

Islands: 1, 7, 10

Collections: 730, 2339, 2571

Cyptotaenia canadensis (L.) DC.

Alluvial forest, 635 feet

Island: 16

Collections: 613, 1369

Daucus carota L.

Open weedy areas, 636 feet

Island: 10

Collection: 2522

Table 1 (continued).

Sium suave Walt.

Moist sand bordering Salix communities , 633 feet

Island: 17

Collection: 2867

Urticaceae (Nettle Family)

Boehmeria cylindrica (L.) Sw.

Moist alluvial woods and borders, 633 feet

Islands: 1, 2, 3, 4, 7, 9, 10, 13, 15, 17, 19,
20, 21, 22, 23

Collections: 337, 485, 566, 1523, 1606, 1641, 1685,
1720, 1780, 1853, 1890, 1935, 1964, 2076, 2094,
2139, 2353, 2645, 2714, 2786

Laportea canadensis (L.) Wedd.

Alluvial woods and borders, 634 feet

Islands: 4, 15, 16, 18

Collections: 316, 646, 1524, 2005, 2138, 2162, 2845

Parietaria pennsylvanica Muhl.

Weedy borders, 636 feet

Islands: 20, 22

Collections: 1886, 2047

Pilea pumila (L.) Gray

Moist alluvial woods, 634 feet

Islands: 1, 4, 16, 18, 20, 23

Collections: 1988, 2458, 2573, 2892, 3057, 3089

Urtica dioica L.

Alluvial woods and borders, 634 feet

Islands: 1, 2, 4, 9, 15, 16, 17, 18, 20, 21

Collections: 278, 318, 492, 587, 645, 1393,
1523a, 1607, 1703, 1782, 1943, 1979, 2039,
2093, 2137, 2161, 2586, 2846

Verbenaceae (Vervain Family)

Lippia lanceolata Michx.

Phyla lanceolata (Michx.) Greene

Moist sand of shorelines and alluvial woods, 633 feet

Islands: 5, 10, 18, 21

Collections: 728, 1508, 1958, 3012

Table 1 (concluded)

Verbena hastata L.

Open areas and moist borders, 633 feet to 636 feet

Islands: 1, 2, 4, 6, 7, 8, 9, 11, 18

Collections: 240, 330, 377, 404, 471, 513, 697, 1553, 1628, 1709, 1758, 1760, 2006, 2155, 2312, 2319, 2343, 2370a, 2381, 2702, 2724, 2771, 3002

Verbena stricta Vent.

Dry open areas, 634 feet to 642 feet

Islands: 2, 4, 8

Collections: 1708, 2387, 2785

Verbena urticifolia L.

Moist sand of Salix communities, 633 feet

Island: 7

Collection: 2370

Vitaceae (Vine Family)

Parthenocissus vitacea (Knerr) Hitchc.

Parthenocissus inserta (Kerner) K. Fritsch

Alluvial woods and borders, 634 feet to 640 feet

Islands: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 17, 18, 19, 22

Collections: 222, 285, 314, 362, 494, 584, 683, 761, 892, 935, 972, 979, 996, 1013, 1020, 1042, 1072, 1126, 1141, 1184, 1204, 1276, 1351, 1450, 1494

Vitis riparia Michx.

Alluvial woods and borders, 634 feet to 640 feet

Islands: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23

Collections: 106, 160, 208, 272, 329, 364, 448, 493, 555, 598, 639, 663, 758, 884, 891, 917, 929, 970, 977, 998, 1012, 1040, 1076, 1114, 1144, 1186, 1215, 1232, 1242, 1278, 1291, 1311, 1350, 1364, 1444, 1445, 1493, 1840, 2064

TABLE 2. Systematic composition of dredged material flora.

<u>Taxon</u>	<u>No. of Families</u>	<u>No. of Genera</u>	<u>No. of Species</u>
Equisetophyta	1	1	2
Coniferophyta	1	1	1
Magnoliophyta			
Liliatae			
(monocots)	9	39	89
Magnoliatae			
(dicots)	<u>53</u>	<u>136</u>	<u>212</u>
TOTAL	64	177	304

TABLE 3. Number of species occurring within the seven most common families.

<u>Family</u>	<u>No. of Species</u>
Gramineae	48
Compositae	42
Cyperaceae	29
Polygonaceae	14
Labiatae	13
Leguminosae	11
Cruciferae	10

ANALYSIS AND DISCUSSION OF SPECIES COMPOSITION AT VARIOUS ELEVATION LEVELS

17. An analysis was conducted of the relationship between herbaceous species and the elevation of the dredged material from which these species were obtained. Woody species were excluded from this analysis since the deposited dredged material covers a portion of their trunks giving a false impression of the elevation at which they grow. Additional dredged material usually does not destroy them once they have become well established. The analysis was also limited to those species for which a minimum of five collections from different sites were obtained. In this way the reporting of more precise results is achieved.

18. Three dredged material elevation categories were recognized. The elevation of Navigation Pool 8 is 631 feet msl. This is the elevation of the water's surface and is the level maintained for commercial navigation by Lock and Dam No. 8 at Genoa, Wisconsin. Elevation Level 1 was determined to be between 631 feet and 634 feet (msl). These dredged material areas usually consist of moist sand and are found along slough and main channel shorelines. The second elevation category ranges from 634 feet to 637 feet (msl) or about 3 to 6 feet above the pool's surface. This and Elevation Level 3, from 637 feet to 650 feet (msl), are much drier areas.

19. Table 4 was prepared from the results of the floristic study. Under each category are recorded the species, including their family designation, generally found in those elevation ranges. A numerical summary of this information is presented in Table 5 for each level. Totals of 71, 103, and 45 species occupy Elevation Levels 1, 2, and 3, respectively. These totals include the species that were found in two or all three groups. This information is presented graphically in Figure 3. In producing Figure 4, those species that grow at more than one elevation level were eliminated. Therefore, Figure 4 represents only those species restricted to one of the three levels. Nineteen

species were found in Elevation Level 1, while 25 species and 4 species were present in Elevation Levels 2 and 3, respectively. As seen in Table 5, a considerable number of herbaceous species could not readily be placed in any single category. Thirty-seven species were commonly found at both Elevations Levels 1 and 2, while another 26 species inhabit both Elevation Levels 2 and 3. An additional 15 species were found at all three levels.

TABLE 4. Composition of herbaceous species by elevation.

LEVEL 1 (631 to 634 feet msl)

Cyperaceae

Carex cristatella Britt.

Carex stipata Muhl.

Cyperus odoratus L.

Cyperus strigosus L.

Eleocharis calva Torr.

Scirpus validus Vahl

Gramineae

Leersia oryzoides (L.) Sw.

Asclepiadaceae

Asclepias incarnata L.

Balsaminaceae

Impatiens biflora Walt.

Compositae

Bidens connata Muhl. var. petiolata (Nutt.) Farw.

Cruciferae

Cardamine pennsylvanica Muhl.

Labiatae

Physostegia formosior Lunell

Scutellaria lateriflora L.

Ranunculaceae

Ranunculus pennsylvanicus L.f.

Rosaceae

Potentilla norvegica L.

Table 4 (continued)

Scrophulariaceae

Gerardia tenuifolia Vahl

Lindernia dubia (L.) Pennell

Mimulus ringens L.

Urticaceae

Boehmeria cylindrica (L.) Sw.

LEVEL 2 634 to 637 feet msl)

Equisetaceae

Equisetum arvense L.

Gramineae

Agropyron repens (L.) Beauv.

Agrostis scabra Willd.

Cenchrus longispinus (Hack.) Fern.

Elymus virginicus L.

Muhlenbergia frondosa (Poir.) Fern.

Poa pratensis L.

Caryophyllaceae

Lynchnis alba Mill.

Myosoton aquaticum (L.) Moench.

Saponaria officinalis L.

Compositae

Achillea millefolium L.

Aster simplex Willd.

Cirsium arvense (L.) Scop.

Cirsium vulgare (Savi) Tenore

Erechtites hieracifolia (L.) Raf.

Solidago altissima L.

Convolvulaceae

Convolvulus sepium L.

Cucurbitaceae

Echinocystis lobata (Michx.) T. & G.

Sicyos angulatus L.

Euphorbiaceae

Euphorbia maculata L.

Leguminosae

Strophostyles helvola (L.) Ell.

Trifolium repens L.

Table 4 (continued)

Oxalidaceae

Oxalis stricta L.

Polygonaceae

Rumex acetosella L.

Ranunculaceae

Ranunculus abortivus L.

LEVEL 3 (637 to 650 feet msl)

Cyperaceae

Cyperus lupulinus (Spreng.) Marcks ssp. lupulinus X Cyperus schweinitzii Torr.

Compositae

Tragopogon dubius Scop.

Labiatae

Monarda punctata L.

Scrophulariaceae

Verbascum thapsus L.

LEVEL 1 and 2 (631 to 637 feet msl)

Cyperaceae

Carex tribuloides Wahlenb.

Cyperus erythrorhizos Muhl.

Cyperus esculentus L.

Gramineae

Agrostis perennans var. aestivalis Vasey

Echinochloa muricata (Beauv.) Fern. var. microstachya Wiegand

Echinochloa muricata (Beauv.) Fern. var. muricata

Echinochloa walteri (Pursh) Heller

Eragrostis hypnoides (Lam.) BSP

Eragrostis pectinacea (Michx.) Nees.

Leersia virginica Willd.

Phalaris arundinacea L.

Amaranthaceae

Amaranthus tamariscinus Nutt.

Amaranthus thberculatus (Moq.) Sauer

Compositae

Aster ontarionis Wieg.

Bidens cernua L.

Table 4 (continued)

LEVEL 1 and 2 (631 to 637 feet msl) (continued)

Bidens frondosa L.
Erigeron annuus (L.) Pers.
Eupatorium maculatum L.
Eupatorium perfoliatum L.

Cruciferae

Barbarea vulgaris R. Br.
Brassica nigra (L.) Koch
Rorippa palustris (L.) Bess. spp. glabra (O. E. Schulz)
Stuckey var. fernaldiana (Butt. & Abbe) Stuckey

Labiatae

Lycopus americanus Muhl
Mentha arvensis L.
Stachys hispida Pursh

Polygonaceae

Polygonum lapathifolium L.
Polygonum pennsylvanicum L.
Rumex crispus L.

Rosaceae

Geum laciniatum Murr.

Rubiaceae

Galium obtusum Bigel.

Scrophulariaceae

Veronica peregrina L. var. peregrina
Veronica peregrina L. var. xalapensis (HBK) Pennell

Solanaceae

Solanum nigrum L.

Urticaceae

Laportea canadensis (L.) Wedd.
Pilea pumila (L.) Gray
Urtica dioica L.

Verbenaceae

Verbena hastata L.

LEVEL 2 and 3 (634 to 650 feet msl)

Cyperaceae

Cyperus schweinitzii Torr.

Table 4 (continued)

LEVEL 2 and 3 (634 to 650 feet msl) (continued)

Gramineae

Bromus tectorum L.
Panicum virgatum L.
Setaria glauca (L.) Beauv.
Sporobolus cryptandrus (Torr.) Gray
Triplasis purpurea (Walt.) Chapm.

Smilacaceae

Smilax hispida Muhl.

Asclepiadaceae

Asclepias syriaca L.

Caparidaceae

Polanisia graveolens Raf.

Chenopodiaceae

Cycloloma atriplicifolium (Spreng.) Coult.
Salsola kali L. var. tenuifolia G. F. W. Meyer

Compositae

Ambrosia artemisiifolia L.
Eupatorium rugosum Houtt.
Lactuca canadensis L.
Lactuca scariola L.
Solidago gigantea Ait. var. gigantea
Solidago gigantea Ait. appr. var. gigantea
Solidago gigantea Ait. var. serotina (Kuntze) Cron.

Cruciferae

Lepidium densiflorum Schrad.
Lepidium virginicum L.
Erysimum cheiranthoides L.

Labiatae

Teucrium canadense L. var. virginicum (L.) Eat.

Leguminosae

Melilotus alba Desr.
Melilotus officinalis (L.) Lam.

Nyctaginaceae

Mirabilis nyctaginea (Michx.) MacM.

Table 4 (concluded)

LEVEL 2 and 3 (634 to 650 feet msl) (continued)

Oxalidaceae

Oxalis europaea Jord.

Polygonaceae

Polygonum scandens L.

LEVEL 1, 2, and 3 (631 to 650 feet msl)

Cyperaceae

Carex laeviconica Dew.

Gramineae

Panicum capillare L.

Setaria viridis (L.) Beauv.

Sphenopholis intermedia Rydb.

Aizoaceae

Mollugo verticillata L.

Chenopodiaceae

Chenopodium album L.

Compositae

Erigeron canadensis L.

Erigeron strigosus Muhl.

Helenium autumnale L.

Taraxacum officinale Weber

Xanthium strumarium L.

Euphorbiaceae

Euphorbia supina Raf.

Onagraceae

Oenothera biennis L. caeciarum Munz.

Scrophulariaceae

Linaria vulgaris Hill

Solanaceae

Solanum dulcamara L.

TABLE 5. Summary of herbaceous species found at various elevations of dredged material.

<u>Elevation Level*</u>	<u>Total No. Species</u>	<u>Total No. Monocots</u>	<u>Total No. Dicots</u>
1 (only)	19	7	12
2 (only)	24	6	18
3 (only)	4	1	3
1 & 2	37	11	26
2 & 3	26	7	19
1, 2, 3	15	4	11

* See text for explanation.

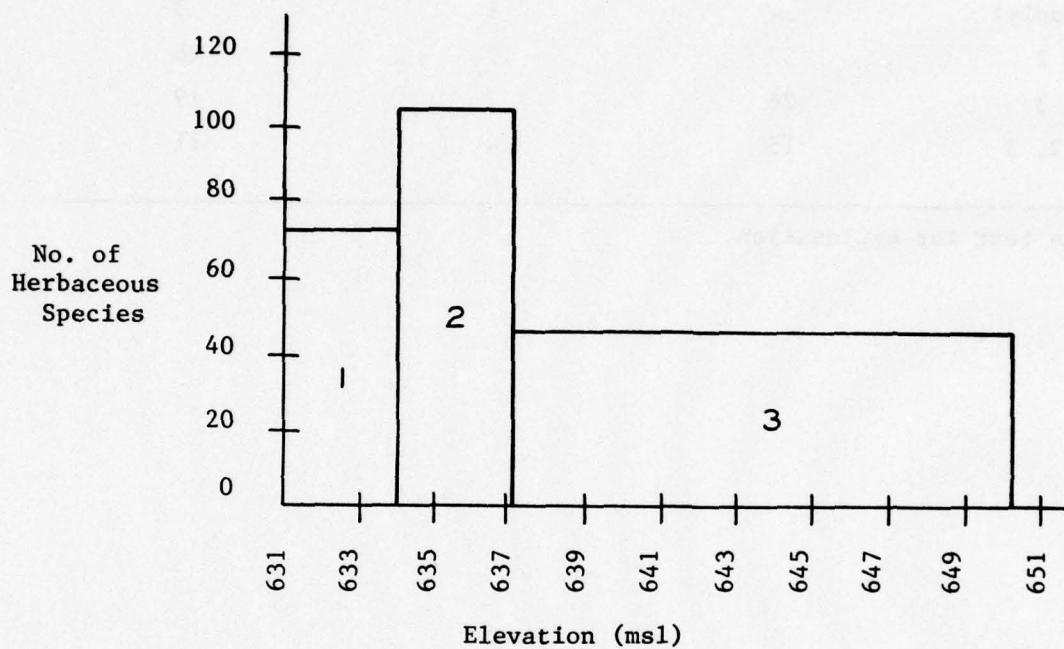


Figure 3. Total number of species present in each of three elevation levels of dredged material in Navigation Pool 8.

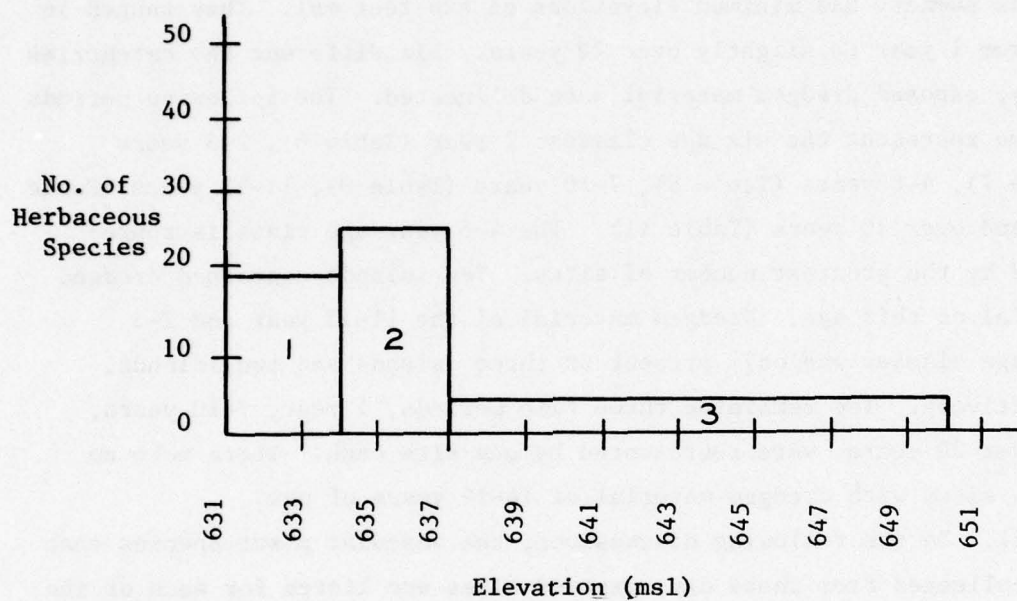


Figure 4. Number of species restricted to elevation levels of dredged material in Navigation Pool 8.

ANALYSIS AND DISCUSSION OF SPECIES COMPOSITION ON
VARIOUS AGES OF DREDGED MATERIAL

20. In addition to the summary that was prepared concerning the herbaceous species found at various elevations, the following summary was prepared for those species present on different ages of dredged material. The dry, exposed dredged material sites that were included in this summary had minimum elevations of 636 feet msl. They ranged in age from 1 year to slightly over 20 years. Six different age categories of dry, exposed dredged material were delineated. The following periods of time represent the six age classes: 1 year (Table 6), 2-3 years (Table 7), 4-6 years (Table 8), 7-10 years (Table 9), 11-13 years (Table 10), and over 20 years (Table 11). The 4-6 year age class is represented by the greatest number of sites. Ten islands contained dredged material of this age. Dredged material of the 11-13 year and 2-3 year age classes was only present on three islands and two islands, respectively. The remaining three time periods, 1 year, 7-10 years, and over 20 years, were represented by one site each. There were no usable sites with dredged material of 14-19 years of age.

21. In the following discussions, the vascular plant species that were collected from those dry, exposed sites are listed for each of the six periods. The species are listed alphabetically within their appropriate families and are vouched for by specimens possessing those particular collection numbers. Certain species are acknowledged separately in the discussions. These are the species which are most abundant on those sites since they were readily observed over the majority of the area. The islands where the collections were obtained are also specifically identified. A numerical summary of this information is presented in Table 12.

Age Class 1 (1 year old)

22. The colonizers of dry, exposed dredged material are Cyperus schweinitzii Torr., Sporobolus cryptandrus (Torr.) Gray, Triplasis purpurea (Walt.) Chapm., and Cycloloma atriplicifolium (Spreng.) Coult.

These species, listed in Table 6, are vouched for by their respective collection numbers. Only a few specimens were present on this site of the other four species that are recorded below. Only one site, Island 11, contained dredged material of age class 1.

TABLE 6. Vascular plants recorded in age class 1 (1 year).

<u>Specimen</u>	<u>Collection No.</u>
Cyperaceae	
<u>Cyperus schweinitzii</u> Torr.	1752, 2882
Gramineae	
<u>Panicum capillare</u> L.	421
<u>Sporobolus cryptandrus</u> (Torr.) Gray	428, 2879
<u>Triplasis purpurea</u> (Walt.) Chapm.	2880
Capparidaceae	
<u>Polanisia graveolens</u> Raf.	287
Chenopodiaceae	
<u>Chenopodium album</u> L.	437
<u>Cycloloma atriplicifolium</u> (Spreng.) Coult.	242, 1751
Leguminosae	
<u>Melilotus alba</u> Desr.	170

Age Class 2 (2-3 years old)

23. A considerably greater number of species were obtained from the 2-3 year old dredged material sites (Table 7). Both Islands 8 and 15 represent this age class, but most specimens were collected from two large areas on Island 8. The four principal colonizers, listed previously, particularly Sporobolus cryptandrus (Torr.) Gray, dominated these areas. Other abundant species were Bromus tectorum L., Mollugo verticillata L., Erigeron canadensis L., both species of Lepidium, and Melilotus alba Desr.

TABLE 7. Vascular plants recorded in age class 2 (2-3 years).

<u>Specimen</u>	<u>Collection No.</u>
Cyperaceae	
<u>Cyperus schweinitzii</u> Torr.	675, 680, 1586, 2411

Table 7 (continued)

Gramineae

<u>Agropyron repens</u> (L.) Beauv.	1081
<u>Bromus tectorum</u> L.	1069, 1083, 1248
<u>Elymus virginicus</u> L.	679, 2402
<u>Panicum capillare</u> L.	692, 2405, 2418
<u>Poa pratensis</u> L.	1070
<u>Setaria viridis</u> (L.) Beauv.	693, 2424
<u>Sporobolus cryptandrus</u> (Torr.) Gray	678, 2421
<u>Triplasis purpurea</u> (Walt.) Chapm.	694, 2415

Aizoaceae

<u>Mollugo verticillata</u> L.	691
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Asclepiadaceae

<u>Asclepias syriaca</u> L.	1585
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Capparidaceae

<u>Polanisia graveolens</u> Raf.	2404
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Caryophyllaceae

<u>Saponaria officinalis</u> L.	699, 2414
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Chenopodiaceae

<u>Chenopodium album</u> L.	2401
<u>Cycloloma atriplicifolium</u> (Spreng.) Coult.	673, 1587
<u>Salsola kali</u> L. var. <u>tenuifolia</u> G. F. W. Meyer	670

Compositae

<u>Ambrosia artemisiifolia</u> L.	2403
<u>Erigeron canadensis</u> L.	674, 2406
<u>Erigeron strigosus</u> Muhl.	688
<u>Lactuca scariola</u> L.	676, 2407, 2423
<u>Solidago gigantea</u> Ait. var. <u>serotina</u> (Kuntze) Cron.	2416
<u>Tragopogon dubius</u> Scop.	1090, 2408
<u>Xanthium strumarium</u> L.	704, 2420

Cruciferae

<u>Lepidium densiflorum</u> Schrad.	1082
<u>Lepidium virginicum</u> L.	672, 695

Euphorbiaceae

<u>Euphorbia supina</u> Raf.	696
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Labiatae

<u>Teucrium canadense</u> L. var. <u>virginicum</u> (L.) Eat.	2417
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Leguminosae

<u>Melilotus alba</u> Desr.	677
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Table 7 (concluded)

Onograceae	
<u>Oenothera biennis</u> L. var. <u>caeciarum</u> Munz.	2413
Polygonaceae	
<u>Polygonum scandens</u> L.	690, 2412

Age Class 3 (4-6 years old)

24. Ten islands in Navigation Pool 8 contained dredged material of age class 3. By far this is the age class that is represented by the greatest number of sites. The four primary colonizers, Sporobolus cryptandrus (Torr.) Gray, Triplasis purpurea (Walt.) Chapm., Cyperus schweinitzii Torr., and Cycloloma atriplicifolium (Spreng.) Coult., remain the dominant species. However, the abundance of Oenothera parviflora L. increases considerably. This was especially noticeable on Island 13. Other abundant species were Bromus tectorum L., Mollugo verticillata L., Erigeron canadensis L., Lepidium densiflorum Schrad., Lepidium virginicum L., Melilotus alba Desr., Polanisia graveolens Raf., Mirabilis nyctaginea (Michx.) MacM., and Polygonum scandens L. Islands 8, 9, 10, 12, 13, 16, 19, 20, 21, and 22 contained suitable sites from which the data presented in Table 8 were collected.

TABLE 8. Vascular plants recorded in age class 3 (4-6 years).

<u>Specimen</u>	<u>Collection No.</u>
Equisetaceae	
<u>Equisetum arvense</u> L.	1584
Cyperaceae	
<u>Carex laeviconica</u> Dew.	1102
<u>Carex lupulinus</u> (Spreng.) Marcks ssp.	
<u>lupulinus</u> X <u>Cyperus schweinitzii</u> Torr.	1953, 2960
<u>Cyperus schweinitzii</u> Torr.	200, 528, 529, 530, 531, 571, 746, 747, 1190, 1211, 1733, 1865, 1917, 2525, 2526
Gramineae	
<u>Agropyron repens</u> (L.) Beauv.	199, 455, 1210, 1263, 1378, 1573, 1576, 1790
<u>Agrostis perennans</u> var. <u>aestivalis</u> Vasey	2929

Table 8 (continued)

<u>Agrostis scabra</u> Willd.	1301
<u>Bromus tectorum</u> L.	201, 452, 527, 923, 937, 944, 957, 1107, 1256, 1257, 1307
<u>Cenchrus longispinus</u> (Hack.) Fern.	1789
<u>Elymus virginicus</u> L.	451, 539, 1904, 1919, 1942
<u>Eragrostis pectinacea</u> (Kichx.) Nees.	1868, 1948
<u>Panicum capillare</u> L.	458, 2964
<u>Panicum virgatum</u> L.	1866
<u>Poa pratensis</u> L.	202, 1098, 1175, 1310
<u>Sphenopholis intermedia</u> Rydb.	1561
<u>Sporobolus cryptandrus</u> (Torr.) Gray	467, 544, 1560, 1730, 1869, 1905, 1914, 2528, 2631, 2663, 2926, 2957, 3018, 3112
<u>Triplasis purpurea</u> (Walt.) Chapm.	750, 2523, 2632, 2664, 2808, 2818, 2927, 2958, 3019, 3054, 3104, 3111
Aizoaceae	
<u>Mollugo verticillata</u> L.	522, 1176, 1221, 1302, 1564, 1878, 1901, 1921, 1949
Asclepiadaceae	
<u>Asclepias syriaca</u> L.	217, 521, 1563, 1827, 2186
Capparidaceae	
<u>Polanisia graveolens</u> Raf.	456, 525, 1565, 1793, 2385
Caryophyllaceae	
<u>Lychnis alba</u> Mill.	1571, 2173
<u>Saponaria officinalis</u> L.	1582, 1951
Chenopodiaceae	
<u>Chenopodium album</u> L.	2530, 2630, 2810, 2817, 3042
<u>Cycloloma atriplicifolium</u> (Spreng.) Coult.	509, 524, 752, 1734, 1913, 2180
<u>Salsola kali</u> L. var. <u>tenuifolia</u> G. F. W. Meyer	523, 753, 1732, 2190, 2383, 2816
Compositae	
<u>Achillea millefolium</u> L.	233, 1297, 1574, 1857
<u>Ambrosia artemisiifolia</u> L.	2639, 2928, 3015, 3107
<u>Cirsium vulgare</u> (Savi) Tenore	2531
<u>Erigeron annuus</u> (L.) Pers.	1295, 1871

Table 8 (continued)

<u>Erigeron canadensis</u> L.	460, 536, 1820, 1873, 1903, 1922. 1954, 2171, 2187, 2527, 2665
<u>Erigeron strigosus</u> Muhl.	225, 454, 1569
<u>Eupatorium rugosum</u> Houtt.	2637
<u>Lactuca canadensis</u> L.	2638, 2806, 3051
<u>Lactuca scariola</u> L.	543, 2191, 2811
<u>Solidago altissima</u> L.	3017a
<u>Solidago gigantea</u> Ait. var. <u>gigantea</u>	2940, 3017
<u>Solidago gigantea</u> Ait. appr. var. <u>gigantea</u>	3101
<u>Solidago gigantea</u> Ait. var. <u>serotina</u> (Kuntze) Cron.	472, 3053
<u>Taraxacum officinale</u> Weber	896, 922
<u>Tragopogon dubius</u> Scop.	526, 1181, 1222, 1879
<u>Xanthium strumarium</u> L.	2386, 2962
Convolvulaceae	
<u>Convolvulus sepium</u> L.	1570, 1825
Cruciferae	
<u>Erysimum cheiranthoides</u> L.	924, 1791, 1876
<u>Lepidium densiflorum</u> Schrad.	198, 943, 1106, 1209, 1305a, 1945
<u>Lepidium virginicum</u> L.	533, 1305, 1859
Euphorbiaceae	
<u>Euphorbia maculata</u> L.	1918, 2959, 3016
<u>Euphorbia supina</u> Raf.	1875, 1902
Labiatae	
<u>Monarda punctata</u> L.	1863, 1952, 2172
<u>Teucrium canadense</u> L. var. <u>virginicum</u> (L.) Eat.	1826, 1864, 2188
Leguminosae	
<u>Melilotus alba</u> Desr.	220, 538, 1185, 1187, 1557
<u>Melilotus officinalis</u> (L.) Lam.	224, 1374, 1580
Nyctaginaceae	
<u>Mirabilis nyctaginea</u> (Michx.) MacM.	218, 468, 1104, 1108, 1180, 1219, 1308
Onagraceae	
<u>Oenothera biennis</u> L. var. <u>Caeciarum</u> Munz.	506, 507, 508, 542, 765, 2179, 2384, 2524, 2660, 2661, 2807, 2819, 3043
Opaliaceae	
<u>Opalis stricta</u> L.	1103, 1298, 1304, 1867

Table 8 (concluded)

Polygonaceae

<u>Polygonum scandens</u> L.	466, 2193, 2636, 2809, 2965
<u>Rumex crispus</u> L.	1577, 1860

Scrophulariaceae

<u>Linaria vulgaris</u> Hill	1856, 1906
<u>Verbascum thapsus</u> L.	219, 520, 1568, 1748, 1824, 1855
<u>Veronica peregrina</u> L. var. <u>xalapensis</u> (HBK) Pennell	925, 1296

Solanaceae

<u>Solanum dulcamara</u> L.	1189
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Age Class 4 (7-10 years old)

25. Only a small area on one dredged material site was suitable for study in this age class. This site, Island 17, was visited 10 years after dredged material was deposited. The collections from the 8 year old sites, Islands 6 and 8, were not included in these results. The 8 year old deposition site on the northern end of Island 8 was of sufficient elevation but was unsuitable because it was almost entirely shaded by cottonwoods. Island 6 consisted of a large exposed deposition area; however, its elevation did not exceed 634 feet msl. Few species were obtained from Island 17. Those that were collected are contained in Table 9. Island 17 was predominately occupied by Sporobolus cryptandrus (Torr.) Gray, Triplasis purpurea (Walt.) Chapm., Cycloloma atriplicifolium (Spreng.) Coult., Bromus tectorum L., Mollugo verticillata L., and Lepidium densiflorum Schrad.

TABLE 9. Vascular plants recorded in age class 4 (7-10 years).

<u>Specimen</u>	<u>Collection No.</u>
Gramineae	
<u>Bromus tectorum</u> L.	1341
<u>Eragrostis pectinacea</u> (Michx.) Nees.	2083
<u>Muhlenbergia frondosa</u> (Poir.) Fern.	2871
<u>Panicum virgatum</u> L.	261, 2085
<u>Poa pratensis</u> L.	1343

Table 9 (continued)

<u>Sphenopholis intermedia</u> Rydb.	1387
<u>Sporobolus cryptandrus</u> (Torr.) Gray	2084, 2872
<u>Triplasis purpurea</u> (Walt.) Chapm.	2873
Aizoaceae	
<u>Mollugo verticillata</u> L.	1339
Chenopodiaceae	
<u>Cycloloma atriplicifolium</u> (Spreng.) Coult.	2090
Compositae	
<u>Solidago gigantea</u> Ait. var. <u>serotina</u> (Kuntze) Cron.	2870
<u>Xanthium strumarium</u> L.	2869, 2875
Cruciferae	
<u>Erysimum cheiranthoides</u> L.	263
<u>Lepidium densiflorum</u> Schrad.	262, 1344
Onagraceae	
<u>Oenothera biennis</u> L. var. <u>caeciarum</u> Munz.	265
Scrophulariaceae	
<u>Veronica peregrina</u> L. var. <u>xalapensis</u> (HBK) Pennell	1342

Age Class 5 (11-12 years old)

26. The three sites, Islands 4, 5, and 10 contained exposed areas of sufficient elevation to study. Sporobolus cryptandrus (Torr.) Gray, Cyperus schweinitzii Torr., and Cycloloma atriplicifolium (Spreng.) Coult. were abundant on the 12 year old dredged material of Islands 4 and 5. Also abundant on Island 4 were Melilotus alba Desr. and Oenothera biennis L. var. caeciarum Munz. Where debris had been deposited by floods, Mirabilis nyctanginea (Michx.) MacM., Polygonum scandens L., and Asclepias syriaca L. grew readily. The 13 year old deposition site on the northern end of Island 10 was carpeted by Panicum capillare L. Bromus tectorum L. and Sporobolus cryptandrus (Torr.) Gray were also present in abundance, while only a few specimens of Oenothera biennis L. var. caeciarum Munz. were seen. The collections from the 12 year old sites, Islands 1, 2, and 3, were not included in the following results since their maximum elevations were 634 feet msl. It was interesting to observe that Sporobolus cryptandrus (Torr.) Gray, Oenothera biennis L. var. caeciarum Munz., Panicum capillare L.,

Polanisia graveolens Raf., and Xanthium strumarium L. were equally prominent on Islands 1 and 2. The following species, found on Islands 4, 5, and 10, are listed in Table 10.

TABLE 10. Vascular plants recorded in age class 5 (11-13 years).

<u>Specimen</u>	<u>Collection No.</u>
Equisetaceae	
<u>Equisetum arvense</u> L.	1143
Cyperaceae	
<u>Cyperus lupulinus</u> (Spreng.) Marcks ssp.	
<u>lupulinus</u> X <u>Cyperus schweinitzii</u> Torr.	1531, 2793
<u>Cyperus schweinitzii</u> Torr.	1489, 1532, 1555, 2451, 2466
Gramineae	
<u>Bromus tectorum</u> L.	1137, 1491
<u>Elymus virginicus</u> L.	2521
<u>Muhlenbergia frondosa</u> (Poir.) Fern.	2510
<u>Panicum capillare</u> L.	2507
<u>Panicum virgatum</u> L.	2514
<u>Poa pratensis</u> L.	1132
<u>Sporobolus cryptandrus</u> (Torr.) Gray	327, 1490, 1535, 2452, 2513
<u>Triplasis purpurea</u> (Walt.) Chapm.	2467
Aizoaceae	
<u>Mollugo verticillata</u> L.	322, 1487
Asclepiadaceae	
<u>Asclepias syriaca</u> L.	1545
Caryophyllaceae	
<u>Saponaria officinalis</u> L.	1485, 2516
Chenopodiaceae	
<u>Chenopodium album</u> L.	2465
<u>Cycloloma atriplicifolium</u> (Spreng.) Coult.	320, 1488, 2470
<u>Salsola kali</u> L. var. <u>tenuifolia</u> G. F. W. Meyer	326, 2789
Compositae	
<u>Ambrosia artemisiifolia</u> L.	2515
<u>Erigeron canadensis</u> L.	323, 2509
<u>Eupatorium rugosum</u> Houtt.	2520
<u>Lactuca canadensis</u> L.	2446, 2790
<u>Lactuca scariola</u> L.	325, 2791
<u>Solidago canadensis</u> L. var. <u>hageri</u> Fern.	2511a
<u>Solidago gigantea</u> Ait. var. <u>gigantea</u>	2447, 2511

Table 10 (continued)

<u>Tragopogon dubius</u> Scop.	1145
Convolvulaceae	
<u>Convolvulus sepium</u> L.	1486
Cruciferae	
<u>Erysimum cheiranthoides</u> L.	1134
<u>Lepidium densiflorum</u> Schrad.	1027, 1139, 1492
Euphorbiaceae	
<u>Euphorbia maculata</u> L.	2794
Leguminosae	
<u>Melilotus alba</u> Desr.	328, 1543
<u>Melilotus officinalis</u> (L.) Lam.	1544
Nyctaginaceae	
<u>Mirabilis nyctaginea</u> (Michx.) MacM.	1534
Onagraceae	
<u>Oenothera biennis</u> L. var. <u>caeciarum</u> Munz.	2450, 2471, 2512
Polygonaceae	
<u>Rumex crispus</u> L.	2518
<u>Polygonum scandens</u> L.	2519, 2792
Scrophylariaceae	
<u>Linaria vulgaris</u> Hill	2517
<u>Verbascum thapsus</u> L.	321
<u>Veronica peregrina</u> L. var. <u>xalapensis</u> (HBK) Pennell	1140
Solanaceae	
<u>Solanum dulcamara</u> L.	1147, 1498

Age Class 6 (20 years old or older)

27. Island 23 was the oldest dredged material site that could be determined utilizing the available records. Although Sporobolus cryptandrus (Torr.) Gray, Cyperus schweinitzii Torr., Cycloloma atriplicifolium (Spreng.) Coult., and Triplasis purpurea (Walt.) Chapm. are still present, they do not dominate the area as on younger dredged material. Woody species are encroaching on the deposition site. The vines of Vitis riparia Michx. cover much of the area. Toxicodendron rydbergii Greene and Rubus occidentalis L. are also moving in from the fringes of the alluvial woods. Specimens collected on Island 23 appear in Table 11.

TABLE 11. Vascular plants recorded in age class 6 (20+ years).

<u>Specimen</u>	<u>Collection No.</u>
Cyperaceae	
<u>Cyperus lupulinus</u> (Spreng.) Marcks ssp. <u>lupulinus</u> X <u>Cyperus schweinitzii</u> Torr.	1831a, 1831, 1850
<u>Cyperus schweinitzii</u> Torr.	1831, 1849
Gramineae	
<u>Bromus tectorum</u> L.	1835
<u>Panicum virgatum</u> L.	1848
<u>Sporobolus cryptandrus</u> (Torr.) Gray	1851
<u>Triplasis purpurea</u> (Walt.) Chapm.	3087
Aizoaceae	
<u>Mollugo verticillata</u> L.	1837
Anacardiaceae	
<u>Toxicodendron rydbergii</u> Greene	3081
Chenopodiaceae	
<u>Chenopodium album</u> L.	3077
<u>Cycloloma atriplicifolium</u> (Spreng.) Coult.	1838
Compositae	
<u>Erigeron canadensis</u> L.	3076
<u>Lactuca canadensis</u> L.	3085
<u>Lactuca scariola</u> L.	3085a
Labiatae	
<u>Monarda punctata</u> L.	3073
<u>Teucrium canadense</u> L. var. <u>virginicum</u> (L.) Eat.	1842
Polygonaceae	
<u>Polygonum scandens</u> L.	3075
Rosaceae	
<u>Rubus occidentalis</u> L.	3098
Scrophulariaceae	
<u>Verbascum thapsus</u> L.	1833
Solanaceae	
<u>Solanum dulcamara</u> L.	1843
Vitaceae	
<u>Vitis riparia</u> Michx.	1840

TABLE 12. Summary of species occurring on different age classes of dredged material.

<u>Age Class*</u>	<u>Total No. Species</u>	<u>Total No. Monocots</u>	<u>Total No. Dicots</u>
1	8	4	4
2	30	9	21
3	58	16	42
4	16	8	8
5	37	10	27
6	20	6	14

*Dredged material of 1 year, 2-3 years, 4-6 years, 7-10 years, 11-13 years, and over 20 years make up Age Classes 1, 2, 3, 4, 5, and 6, respectively.

CONCLUSIONS

28. Plant succession is a slow process in the environment provided by the dry, sandy dredged material. Since the sand is quite porous, low in nutrients, and subject to large fluctuations in temperature, it presents a very rigorous substrate for colonization by plants. The species capable of successfully colonizing these sites in Navigation Pool 8 of the upper Mississippi River were Sporobolus cryptandrus (Torr.) Gray, Cyperus schweinitzii Torr., Cycloloma atriplicifolium (Spreng.) Coult., and Triplasis purpurea (Walt.) Chapm. These were soon followed by Oenothera biennis L. var. caeciarum Munz., Melilotus alba Desr., Erigeron canadensis L., Bromus tectorum L., Mollugo verticillata L., Lepidium densiflorum Schrad., Lepidium virginicum L., and Polanisia graveolens Raf. Little change occurred in the species composition during the short 20 year time period. The most noticeable occurrence was the spread of Vitis riparia Michx. over much of the oldest deposition site. However, an indication of the climax community that would develop was not readily apparent from the sites available in Navigation Pool 8. It is, however, exceedingly interesting that a total of 304 species of vascular plants were found on these sites, even though many of these species were present in very small numbers.

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APPENDIX A: SCIENTIFIC AND COMMON NAMES MENTIONED IN THIS REPORT

<u>Scientific Name</u>	<u>Common Name</u>
<u>Abutilon theophrasti</u> Medic.	velvetleaf
<u>Acalypha rhombioides</u> Raf.	three-seeded mercury
<u>Acer negundo</u> L.	box elder
<u>Acer saccharum</u> L.	silver maple
<u>Acer</u> sp. (seedlings)	maple
<u>Achillea millefolium</u> L.	yarrow
<u>Acnida tamariscina</u> (Nutt.) Wood	waterhemp
<u>Acnida altissima</u> Riddell	----
<u>Agropyron repens</u> (L.) Beauv.	witchgrass, quackgrass
<u>Agrostis gigantea</u> Roth.	redtop
<u>Agrostis hyemalis</u> (Walt.) BSP	ticklegass
<u>Agrostis perennans</u> var. <u>aestivalis</u> Vasey	thingrass
<u>Agrostis scalaris</u> Willd.	hairgrass
<u>Alisma subcordatum</u> Raf.	water plantain
<u>Amaranthus retroflexus</u>	pigweed
<u>Amaranthus tamariscinus</u> Nutt.	waterhemp
<u>Amaranthus tuberculatus</u> (Moq.) Sauer	waterhemp
<u>Ambrosia artemisiifolia</u> L.	common ragweed
<u>Ambrosia trifida</u> L.	great ragweed
<u>Amorpha fruticosa</u> L.	false indigo
<u>Anemone canadensis</u> L.	anemone
<u>Apios americana</u> Medic	wild bean, groundnut
<u>Apocynum cannabinum</u> L.	Indian hemp
<u>Arisaema dracontium</u> L. Schott	green dragon
<u>Artemisia biennis</u> Willd.	wormwood
<u>Artemis ludoviciana</u> Nutt.	western mugwort
<u>Artemisia serrata</u> Nutt.	wormwood
<u>Asclepias incarnata</u> L.	swamp milkweed

<u>Asclepias syriaca</u> L.	common milkweed
<u>Asclepias verticillata</u> L.	whorled milkweed
<u>Asparagus officinalis</u> L.	garden asparagus
<u>Aster ericoides</u> L.	white heath aster
<u>Aster novae-angliae</u> L.	New England Aster
<u>Aster ontarionis</u> Wieg.	aster
<u>Aster simplex</u> Willd.	aster
<u>Aster simplex</u> Willd. var. <u>simplex</u>	aster
<u>Astragalus canadensis</u> L.	milk vetch
<u>Barbarea vulgaris</u> R. Br.	yellow rocket
<u>Berteroa incana</u> (L.) DC	hoary alyssum
<u>Bidens arnua</u> L.	nodding bur-marigold
<u>Bidens comosa</u> (Gray) Wieg.	leafy-tracted tickseed
<u>Bidens connata</u> Muhl. var. <u>petiolata</u> Nutt. Farw.	swamp beggarticks
<u>Bidens frondosa</u> L.	beggarticks
<u>Bidens vulgata</u> Greene	tall beggarticks
<u>Boehmeria cylindrica</u> (L.) Sw.	false nettle
<u>Brassica nigra</u> (L.) Koch	black mustard
<u>Bromus kalmii</u> Gray	wild chess
<u>Bromus tectorum</u> L.	downy brome grass
<u>Betula nigra</u> L.	river birch
<u>Calamagrostis inexpansa</u> Gray var. <u>brevior</u> (Vasey) Stebbins	reed bentgrass
<u>Campanula americana</u> L.	tall bellflower
<u>Cannabis sativa</u> L.	marijuana
<u>Capsella bursa-pastoris</u> (L.) Medic.	shepherd's-purse
<u>Cardamine pennsylvanica</u> Muhl.	bitter cress
<u>Carex brevior</u> Dew. Mackeng.	sedge
<u>Carex cristatella</u> Britt.	crested sedge
<u>Carex emoryi</u> Dew.	water sedge
<u>Carex hystericina</u> Muhl.	porcupine sedge
<u>Carex laeviconica</u> Dew.	hairy-fruited sedge
<u>Carex lanuginosa</u> Michx.	woolly sedge

<u>Carex muhlenbergii</u> Schkuhr.	Muhlenberg's sedge
<u>Carex muskingumensis</u> Schwein.	muskingum sedge
<u>Carex stipata</u> Muhl.	awl-fruited sedge
<u>Carex tenera</u> Dew.	straw sedge
<u>Carex tenera</u> Dew. X <u>Carex normalis</u> Mackenz.	straw sedge
<u>Carex tribuloides</u> Wohlenb.	blunt broom sedge
<u>Carex typhina</u> Michx.	cattail sedge
<u>Carex vulpinoidea</u> Michx.	fox sedge
<u>Catalpa speciosa</u> Warder	catalpa
<u>Celastrus scandens</u> L.	bittersweet
<u>Celtis occidentalis</u> L.	hackberry
<u>Cenchrus longispinus</u> (Hack.) Fern.	sandbur
<u>Cephalanthus occidentalis</u> L.	buttonbush
<u>Cerastium vulgatum</u> L.	common chickweed
<u>Chenopodium album</u> L.	lamb's quarters
<u>Cicuta bulbifera</u> L.	water hemlock
<u>Cirsium arvense</u> (L.) Scop.	Canadian thistle
<u>Cirsium vulgare</u> (Savi) Tenore	bull thistle
<u>Convolvulus sepium</u> L.	wild morning glory
<u>Conyza canadensis</u> (L.) Cron.	horseweed
<u>Cornus obliqua</u> Raf.	silky dogwood
<u>Cornus rugosa</u> Lam.	round-leaved dogwood
<u>Cornus stolonifera</u> Michx.	red osier
<u>Cuscuta</u> sp.	dodder
<u>Cryptotaenia canadensis</u> (L.) DC	honestwort
<u>Cycloloma atriplicifolium</u> (Spreng.) Coult.	winged pigweed
<u>Cyperus aristatus</u> Roltb.	awned cyperus
<u>Cyperus erythrorhizos</u> Muhl.	red-rooted cyperus
<u>Cyperus esculentus</u> L.	chufa
<u>Cyperus inflexus</u> Muhl.	awned cyperus
<u>Cyperus lupulinus</u> (Spreng.) Marcks ssp. <u>lupulinus</u>	slender-stemmed cyperus
<u>Cyperus lupulinus</u> (Spreng.) Marcks ssp. <u>lupulinus</u> X <u>Cyperus schweinitzii</u> Torr.	umbrella sedge

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<u>Cyperus odoratus</u> L.	coarse cyperus
<u>Cyperus vivularis</u> Kunth	shining cyperus
<u>Cyperus schweinitzii</u> Torr.	Schweinitz's cyperus
<u>Cyperus strigosus</u> L.	straw-colored cyperus
<u>Daucus carota</u> L.	Queen Anne's lace
<u>Digitaria ischaemum</u> (Schreb.) Muhl.	small crabgrass
<u>Digitaria sanguinalis</u> (L.) Scop.	large crabgrass
<u>Echinochloa crusgalli</u> (L.) Beauv. var. <u>crusgalli</u>	barnyard grass
<u>Echinochloa muricata</u> (Beauv.) Fern. var. <u>microstachya</u> Wiegand	barnyard grass
<u>Echinochloa muricata</u> (Beauv.) Fern. var. <u>muricata</u>	barnyard grass
<u>Echinochloa walteri</u> (Pursh) Heller	cockspur grass
<u>Echinocystis lobata</u> (Michx.) T. & G.	wild cucumber
<u>Eleocharis acicularis</u> (L.) R. & S.	spike rush
<u>Eleocharis calva</u> Torr.	spike rush
<u>Eleocharis obtusa</u> (Willd.) Schult.	blunt spike rush
<u>Elymus canadensis</u> L.	nodding wild rye
<u>Elymus virginicus</u> L.	terrell grass
<u>Epilobium glandulosum</u> Lehm.	willow herb
<u>Equisetum arvense</u> L.	common horsetail
<u>Equisetum hyemale</u> L.	scouring rush
<u>Eragrostis frankii</u> C. A. Mey.	Frank's lovegrass
<u>Eragrostis hypnoides</u> (Lam.) BSP	smooth creeping lovegrass
<u>Eragrostis pectinacea</u> (Michx.) Nees.	purple lovegrass
<u>Eragrostis spectabilis</u> (Pursh) Steud.	tumblegrass
<u>Erechtites hieracifolia</u> L. Raf.	pilewort
<u>Erigeron annuus</u> L. Pers.	daisy fleabane
<u>Erigeron canadensis</u> L.	horseweed
<u>Erigeron philadelphicus</u>	fleabane
<u>Erigeron strigosus</u> Muhl.	daisy fleabane
<u>Erysimum cheiranthoides</u>	wormseed mustard
<u>Eupatorium maculatum</u> L.	Joe-pye-weed
<u>Eupatorium perfoliatum</u> L.	boneset

<u>Eupatorium rugosum</u> Houtt.	white snakeroot
<u>Euphorbia maculata</u> L.	eyebane
<u>Euphorbia supina</u> Raf.	milk-purslane
<u>Festuca octoflora</u> (Walt.)	slender fescuegrass
<u>Fraxinus pennsylvanica</u> Marsh.	green ash
<u>Froelichia floridana</u> (Nutt.) Moq.	cottonwood
<u>Galinsoga ciliata</u> (Raf.) Blake	----
<u>Galium aparine</u> L.	spring cleavers
<u>Galium obtusum</u> Bigel.	marsh bedstraw
<u>Galium tinctorium</u> L.	marsh bedstraw
<u>Geranium carolinianum</u> L.	crane's bill
<u>Gerardia tenuifolia</u> Vahl	Bessey's gerardia
<u>Geum laciniatum</u> Murr.	avens
<u>Glechoma hederacea</u> L. var. <u>parviflora</u> Druce	ground-ivy
<u>Glyceria grandis</u> S. Wats.	reed meadow grass
<u>Gnaphalium obtusifolium</u> L.	catfoot
<u>Hackelia virginiana</u> (L.) I. M. Johnston	stickweed
<u>Hedeoma hispida</u> Pursh	mock pennyroyal
<u>Helenium autumnale</u> L.	sneezeweed
<u>Heliopsis helianthoides</u> L. Sweet	oxeye
<u>Hemicarpha micrantha</u> (Vahl) Pox	----
<u>Impatiens biflora</u> Walt.	touch-me-not
<u>Iris virginica</u> L. var. <u>shrevei</u> (Small) E. Anders	blue flag
<u>Juglans nigra</u> L.	black walnut
<u>Juncus dudleyi</u> Wieg.	Dudley's rush
<u>Juncus effusus</u> L.	soft rush
<u>Juncus nodosus</u> L.	knotted rush
<u>Juniperus communis</u> L.	common juniper
<u>Lactuca biennis</u> (Moench) Fern.	wild lettuce
<u>Lactuca canadensis</u> L.	tall lettuce
<u>Lactuca scariola</u> L.	prickly lettuce
<u>Laportea canadensis</u> L. Wedd.	wood nettle
<u>Lathyrus palustris</u> L.	marsh vetchling

<u>Leersia lenticularis</u> Michx.	catchfly grass
<u>Leersia oryzoides</u> (L.) Sw.	rice cutgrass
<u>Leersia virginica</u> Willd.	whitegrass
<u>Leptoloma cognatum</u> (Schultes) Chase	fall witchgrass
<u>Linaria canadensis</u> (L.) Dumont	old-field toadflax
<u>Linaria vulgaris</u> Hill	butter-and-eggs
<u>Lindernia dubia</u> (L.) Pennell	false pimpernel
<u>Lipidium densiflorum</u> Schrad.	peppergrass
<u>Lepidium virginicum</u> L.	poor man's pepper
<u>Lippia lanceolata</u> Michx.	frogfruit
<u>Lobelia cardinalis</u> L.	cardinal flower
<u>Lobelia siphilitica</u> L.	great lobelia
<u>Lonicera tatarica</u> L.	tartarian honeysuckle
<u>Lonicera x bella</u> Zabel	honeysuckle
<u>Lychnis alba</u> Mill.	white cockle, white campion, evening lychnis
<u>Lycopus americanus</u> Muhl.	water-horehound
<u>Lycopus virginicus</u> L.	water-horehound
<u>Lysimachia ciliata</u> L.	fringed loosestrife
<u>Lysimachia hybrida</u> Michx.	lance-leaved loosestrife
<u>Lysimachia terrestris</u> (L.) BSP	swamp loosestrife, swamp candles
<u>Medicago lupulina</u> L.	black medic
<u>Melilotus alba</u> Desr.	white sweet clover
<u>Melilotus officinalis</u> (L.) Lam.	yellow sweet clover
<u>Manispermum canadense</u> L.	moonseed
<u>Mentha arvensis</u> L.	field mint
<u>Mimulus ringens</u> L.	monkey flower
<u>Mirabilis nyctaginea</u> (Michx.) MacM.	four o'clock
<u>Mollugo verticillata</u> L.	carpetweed
<u>Monarda punctata</u> L.	horsemint
<u>Morus alba</u> L.	white mulberry
<u>Muhlenbergia frondosa</u> (Poir.) Fern.	dropseed
<u>Muhlenbergia racemosa</u> (Michx.) BSP	wild timothy

<u>Myosoton aquaticum</u> (L.) Moench	giant chickweed
<u>Nepeta cataria</u> L.	catnip
<u>Oenothera biennis</u> L. var. <u>caeciarum</u> Munz.	evening primrose
<u>Oenothera rhombipetala</u> Nutt.	rhombic evening primrose
<u>Oxalis europaea</u> Jord.	lady's sorrel
<u>Oxalis stricta</u> L.	yellow wood sorrel
<u>Panicum capillare</u> L.	old witchgrass
<u>Panicum dichotomiflorum</u> Michx.	spreading witchgrass
<u>Panicum lanuginosum</u> Ell. var. <u>implicatum</u> (Schribn.) Fern.	woolly panic grass
<u>Panicum lanuginosum</u> Ell. var. <u>septentrionale</u> Fern.	woolly panic grass
<u>Panicum oligosanthos</u> Schultes var. <u>scribnerianum</u> (Nash) Fern.	few-flowered panic grass
<u>Panicum virgatum</u> L.	switchgrass
<u>Parietaria pennsylvanica</u> Muhl.	pellitory
<u>Parthenocissus inserta</u> (Kerner) K. Fritsch	woodbine
<u>Parthenocissus vitacea</u> (Knerr) Hichc.	Virginia creeper
<u>Paspalum ciliatifolium</u> var. <u>stramineum</u> (Nash) Fern.	ciliate paspalum
<u>Penthorum sedifolium</u> L.	ditch stonecrop
<u>Phalaris arundinacea</u> L.	reed canary grass
<u>Phalaris pratensis</u> L.	common timothy
<u>Phragmites australis</u> (Cav.) Trin. ex Steud.	giant reed
<u>Physostagia formosior</u> Lunell	false dragonhead
<u>Pilea pumila</u> (L.) Gray	clearweed
<u>Plantago major</u> L.	common plantain
<u>Plantago rugelii</u> Dcne.	plantain
<u>Poa compressa</u> L.	Canada bluegrass
<u>Poa palustris</u> L.	fowl meadowgrass
<u>Poa pratensis</u> L.	Kentucky bluegrass
<u>Polanisia graveolens</u> Raf.	clammyweed
<u>Polygonatum canaliculatum</u> (Muhl.) Pursh	solomon's seal
<u>Polygonum aviculare</u> L.	knotweed
<u>Polygonum coccineum</u> Muhl.	smartweed

<u>Polygonum erectum</u> L.	erect knotweed
<u>Polygonum hydropiper</u> L.	water pepper
<u>Polygonum lapathifolium</u>	dock-leaved smartweed
<u>Polygonum pennsylvanicum</u> L.	Pennsylvania smartweed
<u>Polygonum punctatum</u> Ell.	dotted smartweed
<u>Polygonum scandens</u> L.	climbing false buckwheat
<u>Populus deltoides</u> Marsh.	cottonwood
<u>Potentilla argentea</u> L.	silvery cinquefoil
<u>Potentilla morvegica</u> L.	five finger cinquefoil
<u>Prunus americana</u> Marsh.	wild plum
<u>Prunus serotina</u> Ehrh.	black cherry
<u>Prunus virginiana</u> L.	chock cherry
<u>Quercus bicolor</u> Willd.	swamp white oak
<u>Quercus velutina</u> Lam.	black oak
<u>Ranunculus abortivus</u> L.	kidneyleaf buttercup
<u>Ranunculus pennsylvanicus</u> L. f.	bristly crowfoot
<u>Rhus glabra</u> L.	smooth sumac
<u>Rhus typhina</u> L.	staghorn sumac
<u>Ribes americanum</u> Mill.	wild black currant
<u>Robinia pseudo-acacia</u> L.	black locust
<u>Rorippa palustris</u> L. Bess. ssp. <u>glabra</u> (O. E. Schultze) Stuckey var. <u>fernaldiana</u> (Butt. & Abbe) Stuckey	yellow cress
<u>Rosa acicularis</u> Lindl.	prickly rose
<u>Rosa blanda</u> Ait.	meadow rose
<u>Rubus flagellaris</u> L.	northern dewberry
<u>Rubus occidentalis</u> L.	black raspberry
<u>Rudbeckia laciniata</u> L.	tall coneflower
<u>Rumex acetosella</u> L.	sheep sorrel
<u>Rumex crispus</u> L.	curly dock
<u>Rumex mexicanus</u> Meisn.	willow-leaved dock
<u>Rumex orbiculatus</u> Gray	water dock
<u>Rumex patientia</u> L.	patience dock
<u>Rumex verticillatus</u> L.	swamp dock

<u>Salix amygdaloides</u> Anders.	peach-leaved willow
<u>Salix fragilis</u> L.	crack willow
<u>Salix interior</u> Rowlee	sandbar willow
<u>Salix nigra</u> Marsh.	black willow
<u>Salix rigida</u> Muhl.	willow
<u>Salsola kali</u> L.	Russian thistle
<u>Sambucus canadensis</u> L.	common elder
<u>Saponaria officinalis</u> L.	bouncing bet
<u>Scirpus atrovirens</u> Willd.	dark green bulrush
<u>Scirpus cyperinus</u> (L.) Kunth	woolgrass
<u>Scirpus validus</u> Vahl	softstem bulrush
<u>Scrophularia marilandica</u> L.	figwort
<u>Scutellaria epilobiifolia</u> A. Hamilton	skullcap
<u>Scutellaria galericulata</u> L.	marsh skullcap
<u>Scutellaria lateriflora</u> L.	mad-dog skullcap
<u>Sedum sarmentosum</u> Bunge	stonecrop
<u>Setaria glauca</u> (L.) Beauv.	yellow foxtail
<u>Setaria viridis</u> (L.) Beauv.	green foxtail
<u>Sicyos angulatus</u> L.	bur-cucumber
<u>Silene antirrhina</u> L.	sleepy catchfly
<u>Silene cserei</u> Baumg.	catchfly
<u>Sisymbrium altissimum</u> L.	tumbling mustard
<u>Smilacina racemosa</u> (L.) Desf.	false solomon's seal
<u>Smilacina stellata</u> (L.) Desf.	false solomon's seal
<u>Smilax hispida</u> Muhl.	catbrier
<u>Solanum carolinense</u> L.	horse nettle
<u>Solanum dulcamara</u> L.	European bittersweet
<u>Solanum nigrum</u> L.	black nightshade
<u>Solidago altissima</u> L.	tall goldenrod
<u>Solidago canadensis</u> L. var. <u>hargeri</u> Fern.	Canada goldenrod
<u>Solidago canadensis</u> L. var. <u>scabra</u> (Muhl.)	
T. & G.	rock goldenrod
<u>Solidago gigantea</u> Ait. var. <u>gigantea</u>	goldenrod

<u>Solidago gigantea</u> Ait. appr. var. <u>gigantea</u>	late goldenrod
<u>Solidago gigantea</u> Ait. var. <u>serotina</u> Kuntze Cron.	late goldenrod
<u>Spartina pectinata</u> Link	prairie cordgrass
<u>Sphenopholis intermedia</u> Rydb.	wedgegrass
<u>Sporobolus cryptandrus</u> (Torr.) Gray	sand dropseed
<u>Stachys hispida</u> Pursh	rough hedge nettle
<u>Stachys tenuifolia</u> Willd.	smooth hedge nettle
<u>Stellaria media</u> (L.) Cyrillo	common chickweed
<u>Strophostyles helvola</u> (L.) Ell.	wild bean
<u>Sium suave</u> Walt.	water parsnip
<u>Tanacetum vulgare</u> L.	tansy
<u>Taraxacum officinale</u> Weber	common dandelion
<u>Teucrium candense</u> L. var. <u>virginicum</u> (L.) Eat.	germander
<u>Tilia americana</u> L.	basswood, linden
<u>Toxicodendron rydbergii</u> Greene	poison ivy
<u>Tradescentia ohiensis</u> Raf.	spiderwort
<u>Tragopogon dubius</u> Scop.	goat's beard
<u>Trifolium pratense</u> L.	native red clover
<u>Trifolium repens</u> L.	white dutch clover
<u>Triplasis purpurea</u> (Walt.) Chapm.	sand grass
<u>Ulmus americana</u> L.	American elm
<u>Urtica dioica</u> L.	stinging nettle
<u>Verbascum thapsus</u> L.	common mullein
<u>Verbena hastata</u> L.	blue vervain
<u>Veronica peregrina</u> L. var. <u>peregrina</u>	purslane speedwell
<u>Veronica peregrina</u> L. var. <u>xalapinsis</u> (HBK) Pennell	purslane speedwell
<u>Vitus riparia</u> Michx.	riverbank grape
<u>Vulpia octoflora</u> (Walt.) Rydb. var. <u>tenella</u> (Willd.) Fern.	fescuegrass
<u>Xanthium strumarium</u> L.	cocklebur

In accordance with letter from DAEN-RDC, DAEN-ASI dated 22 July 1977, Subject: Facsimile Catalog Cards for Laboratory Technical Publications, a facsimile catalog card in Library of Congress MARC format is reproduced below.

Ziegler, S R

The flora of dredged material sites in Navigation Pool 8 of the Upper Mississippi River / by S. R. Ziegler, S. H. Sohmer, University of Wisconsin, La Crosse, La Crosse, Wisconsin. Vicksburg, Miss. : U. S. Waterways Experiment Station ; Springfield, Va. : available from National Technical Information Service, 1977.

87, 10 p. : ill. ; 27 cm. (Technical report - U. S. Army Engineer Waterways Experiment Station ; D-77-31)

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References: p. 85-87.

1. Disposal areas. 2. Dredged material. 3. Mississippi River. 4. Plants (Botany). 5. Waste disposal sites. I. Sohmer, S. R., joint author. II. United States. Army. Corps of Engineers. III. Wisconsin. University. IV. Series: United States. Waterways Experiment Station, Vicksburg, Miss. Technical report ; D-77-31.
TA7.W34 no.D-77-31